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ABSTRACT

This booklet provides demographic, geographic, and employment characteristics for the 1,100,000 engineers and 900,000 scientists in the United States in 1974. Data presented include the distribution of men and women scientists by field and by work activities, distribution of scientists by age and type of employer, and information on the distribution of minority group scientists by field. The geographic distribution of scientists and engineers is also presented. Appendices to the report include technical notes related to the collection and synthesis of data (including estimates of sampling errors), detailed tables of data, and copies of cover letters and survey forms. (SD)

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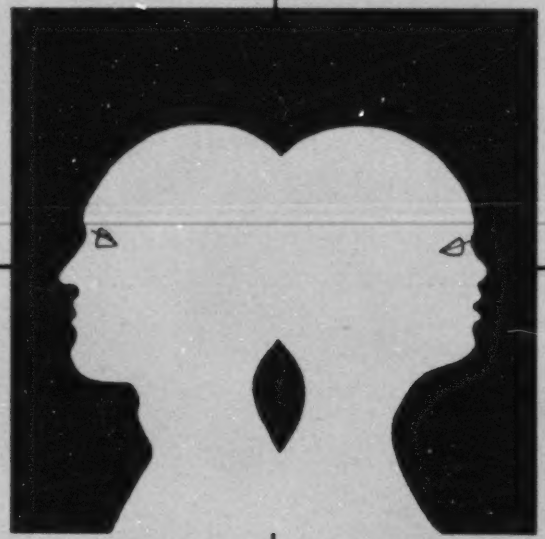

U.S. Scientists and Engineers: 1974

Surveys of Science Resources Series
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FOREWORD

The scientific and engineering population of the United States, although a relatively small proportion of the total, constitutes one of the Nation's vital manpower assets. The status and improvement of our national well-being depends, to a significant extent upon the contributions of these scientists and engineers. Consequently, effective policies and programs related to the supply and utilization of the technical manpower pool and to scientific and technical activities in general are important. The development of such policies and programs requires good statistical information on the Nation's scientists and engineers; such information is provided by the National Science Foundation's Manpower Characteristics System.

This report, based on the Manpower Characteristics System and other data sources pertinent to selected parameters, presents detailed statistical estimates on the demographic, educational, and professional characteristics of the two million scientists and engineers in the United States. Special attention was given to the development of estimates of women and minority scientists and engineers wherever possible. It is expected that this information will be updated on a biennial basis.

The National Science Foundation gratefully acknowledges the cooperation and the assistance of the Board of Human Resources, National Research Council; the Laboratory for Research and Higher Education, Graduate School of Education, University of California, Los Angeles; and the Bureau of the Census, Department of Commerce. These organizations conducted the surveys for the NSF that generated the data base for this report. Appreciation is also extended to the many individual scientists and engineers who took the time and effort to respond to the various surveys.

The report was prepared in the Division of Science Resources Studies of the National Science Foundation. Overall guidance was provided by Robert R. Trumble, Head, Manpower Studies Section, and his predecessor, Robert W. Cain.

September 1976

Charles E. Falk
Director, Division of Science
Resources Studies

acknowledgments

This report was prepared by J. James Brown, Study Director, Manpower Characteristics Studies Group, with the assistance of John A. Scopino, Nancy M. Conlon, and Gayle F. Barker.

The principal surveys used in formulating the estimates reported were conducted by the Bureau of the Census, the Laboratory for Higher Education of the University of California at Los Angeles, and the Commission on Human Resources of the National Research Council.

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INTRODUCTION

The need for a more statistically reliable reporting system for characteristics of scientific and engineering (S/E) manpower became evident in the late sixties. These needs and the rapidly increasing costs of the previously used National Register of Scientific and Technical Personnel led to the initiation of the Manpower Characteristics System in 1971. Although a biennial census of the Nation's scientists and engineers would be the optimal method by which the data needs of science policymakers could be met, it was deemed not to be a practical solution in terms of the burden it would place on individual scientists and engineers and the financial resources it would require. It was recognized, however, that there were several well-defined segments of the S/E population from which manpower data could be obtained by the use of sampling procedures, a method that would also reduce the burden upon individuals and require less financial resources than a census.

Using this approach the Foundation developed its Manpower Characteristics System. This system includes three subsystems: The Roster of Doctoral Scientists and Engineers, the National Sample, and the New Entrants Surveys. The Roster of Doctoral Scientists and Engineers, maintained by the Commission on Human Resources, National Academy of Sciences-National Research Council, consists of all known doctoral scientists and engineers in the United States starting with the year 1930. The Roster serves as a panel from which a 22-percent sample of about 60,000 doctoral scientists and engineers were selected to provide data on the doctoral population of the Nation. The National Sample, consisting of about 50,000 individuals (a 4-percent sample), was drawn from those scientists and engineers who were in the employed labor force at the time of the 1970 decennial census. Information on this group of scientists and engineers was collected in 1972 and 1974 by the Bureau of the Census which maintains the National Sample. The New Entrants Surveys are designed to measure the magnitude and characteristics of scientists and engineers entering the S/E labor force since the 1970 decennial census. Samples of the graduating classes of 1971, 1972, and 1973 were surveyed for the Foundation by the Laboratory for Research in Higher Education, University of California, Los Angeles.

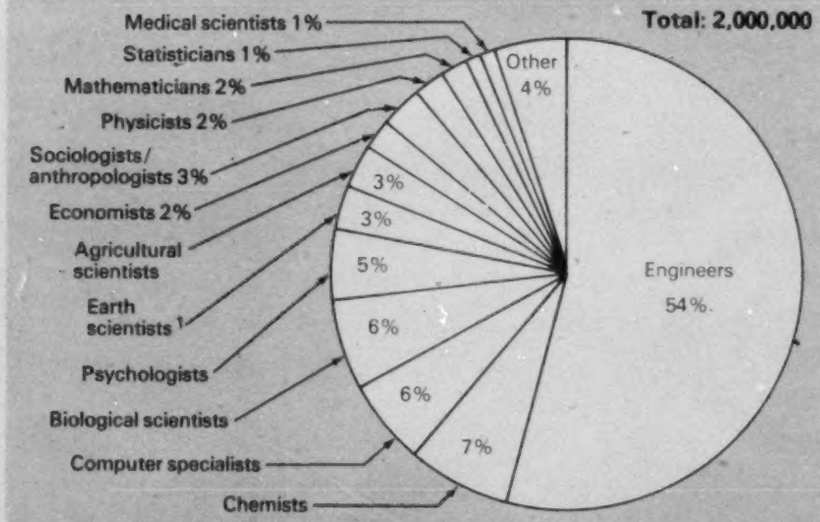
The data presented in this report are estimates based upon the information produced by the Manpower Characteristics System and other national S/E manpower data emanating from surveys conducted by the Foundation, other Government agencies, and private organizations. Information from these latter organizations was used to check selected estimates. The report is organized in three parts: Demographic Characteristics, Employment Characteristics, and Geographic Characteristics. Information on women and minorities is presented separately for most of the major parameters. The appendixes contain the technical notes and the detailed statistical tables.

THE NATION'S SCIENTISTS AND ENGINEERS

Almost two million individuals constituted the S-E population of the United States in spring 1974; 1,100,000 were engineers and the remaining 900,000 were scientists.[1] Included were those individuals who possessed two of the three following characteristics: Employed as a scientist or engineer; expressed a professional identification as a scientist or engineer; or, whose highest academic degree was in science or engineering. Chemists were the largest single group of scientists numbering about 138,000, followed by computer specialists, 125,000; biological scientists, 117,000; and psychologists, 95,000. Slightly less than 1 in 10 were women—185,000—although the ratio of women to men among scientists was 1 in 5; among engineers, however, women numbered less than 1 in 100. Over one-half of the women were either biological scientists, psychologists, computer specialists, or sociologists/anthropologists.

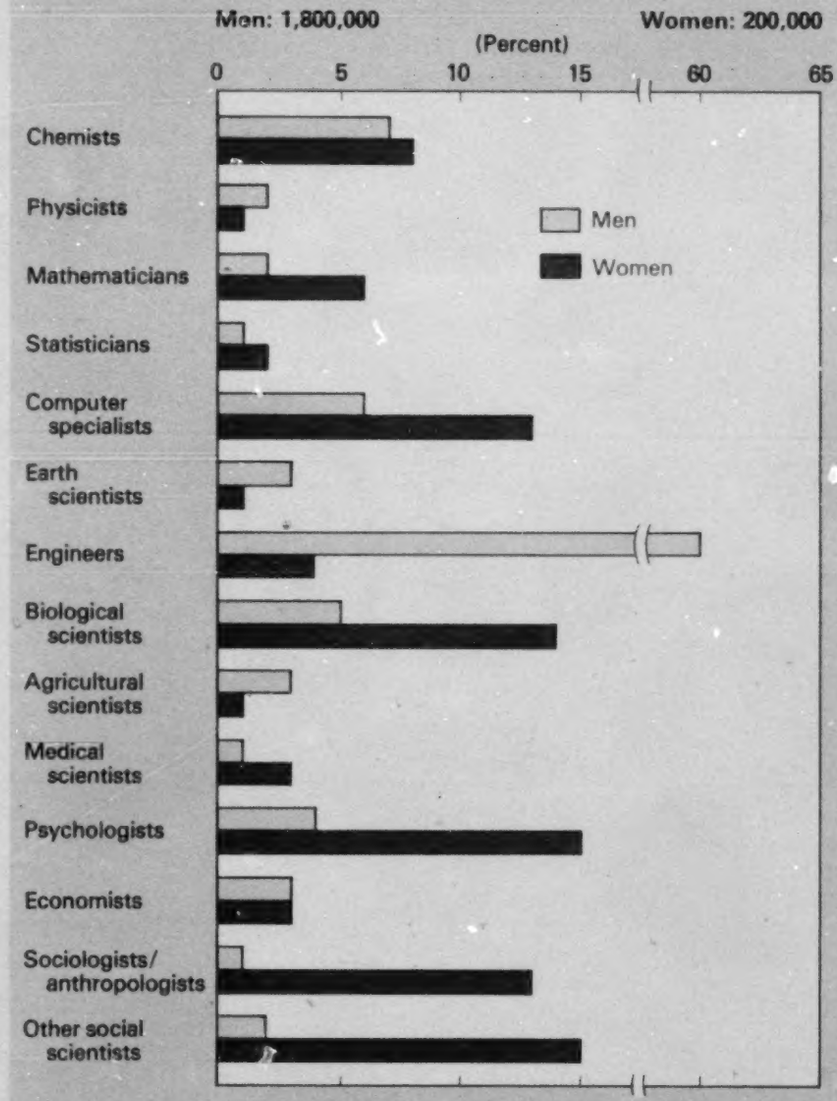
[1] Of the two million scientists and engineers almost 1,700,000 were in the active labor force.

Scientists and engineers: 1974



[1] Includes oceanographers and atmospheric scientists.
SOURCE: National Science Foundation

Distribution of men and women scientists and engineers by field as a proportion of each sex group: 1974

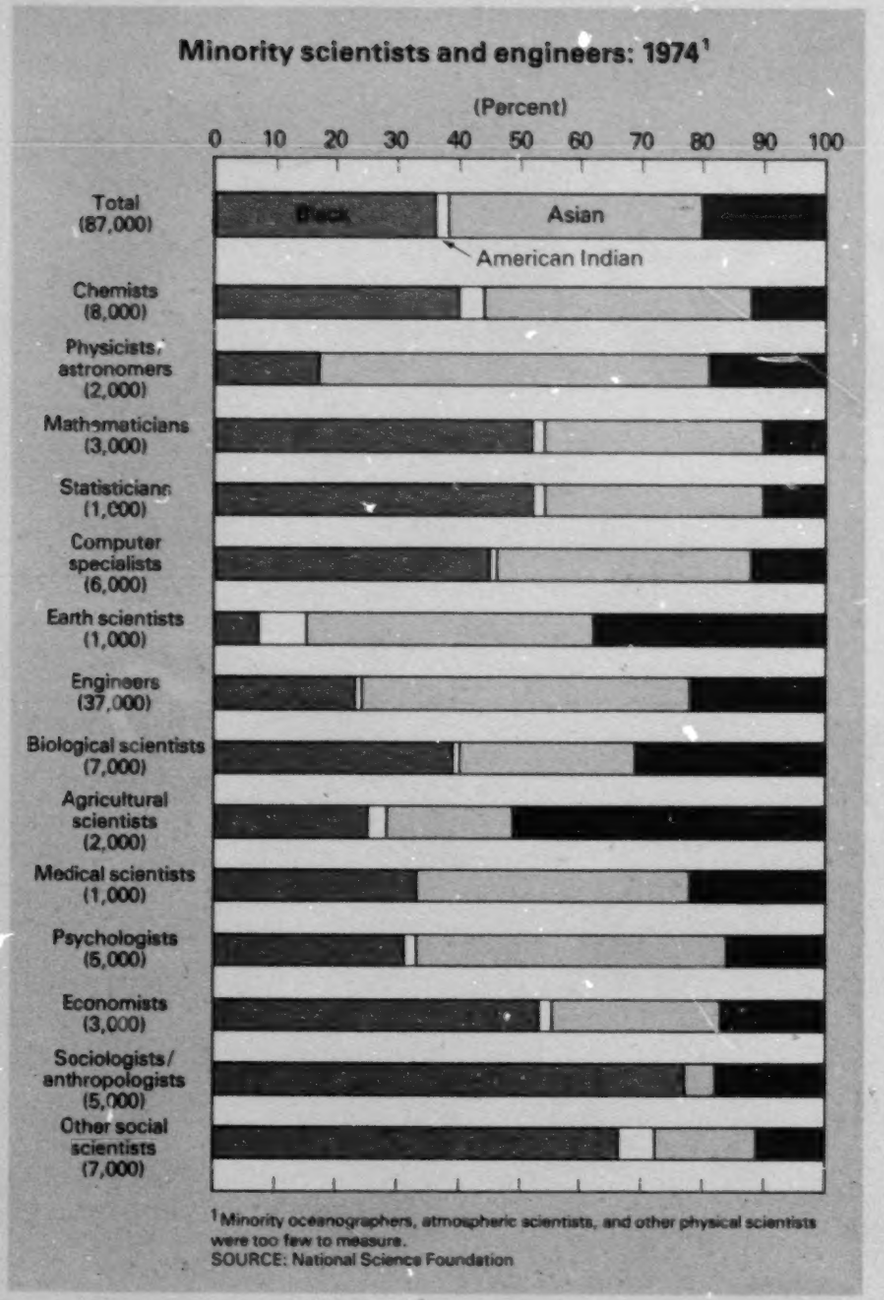


[1] Includes oceanographers and atmospheric scientists.
SOURCE: National Science Foundation

Demographic Characteristics

MINORITIES AND WOMEN

Minorities accounted for 4 percent of the scientists and engineers—6 percent of the scientists and 3 percent of the engineers. Blacks were the largest minority group for scientists, 23,000; while Asians were the largest group of minority engineers, 20,000. About 10 percent of the sociologists/anthropologists were members of minorities, while 6 percent of the mathematicians, statisticians, and biological scientists, and 5 percent of the chemists, physicists/astronomers, and economists were so classified. Women constitute 19 percent (16,000) of the minority scientists and engineers. Among minority women, sociologists account for 17 percent, psychologists 15 percent, and chemists 11 percent. Over two-thirds of the black women were, in descending order, sociologists/anthropologists, biological scientists, computer specialists, psychologists, or economists. Asian women reported a different order of concentration with over two-thirds of them being psychologists, chemists, biological scientists, and computer specialists. Blacks constituted the largest minority group in most fields.



[1] Minority oceanographers, atmospheric scientists, and other physical scientists were too few to measure.
SOURCE: National Science Foundation

AGE

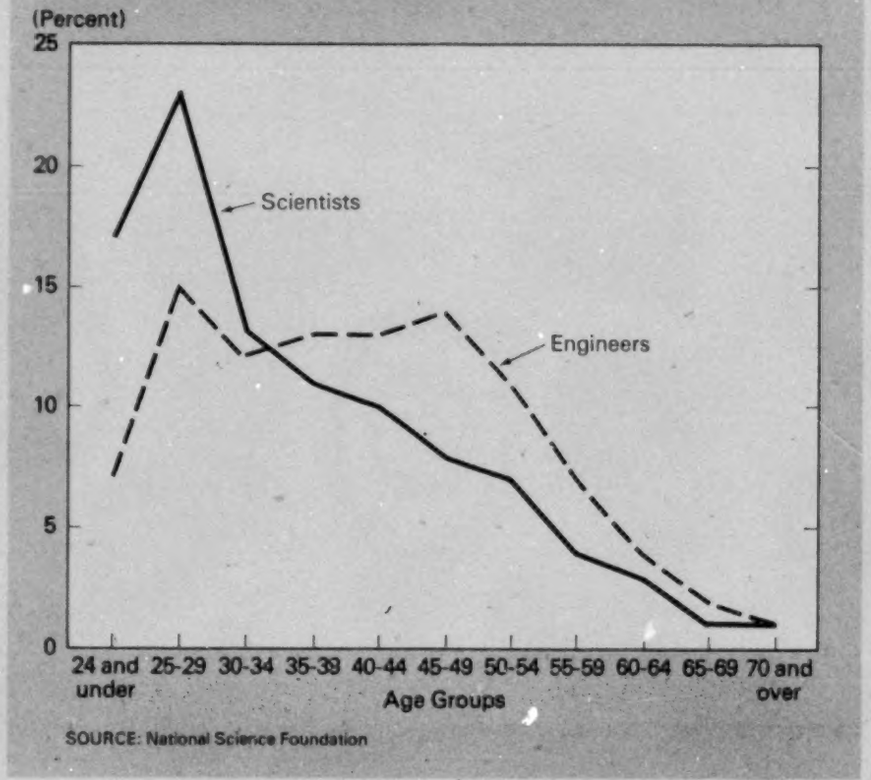
The median age of the S/E population in 1974 was 36 years: scientists reported a median of 33 years and engineers 40 years. Computer specialists, biological scientists, psychologists, and sociologists/anthropologists reported median ages under 30 years, reflecting the recent influx of young people into these areas. Medical and atmospheric scientists were older; they reported median ages over 40 years. Women scientists and engineers, younger than their male counterparts, reported a median age of 27 years and 28 years, respectively. Women chemists, physicists/astronomers, earth scientists, and engineers were considerably younger than men; each reported a median age difference of about 10 years.

Median age of scientists and engineers by sex: 1974

Field	Total	Men	Women
Total, all fields	36	38	27
Chemists	38	39	29
Physicists/astronomers	36	36	28
Other physical scientists	40	41	32
Mathematicians	32	32	29
Statisticians	32	34	28
Computer specialists	29	31	26
Earth scientists	37	38	27
Oceanographers	37	37	(')
Atmospheric scientists	45	45	(')
Engineers	40	40	28
Biological scientists	28	28	26
Agricultural scientists	39	40	35
Medical scientists	41	41	40
Psychologists	29	30	29
Economists	34	35	32
Sociologists/anthropologists	27	29	25
Other social scientists	27	28	25

' Too few cases to compute a median.
Source: National Science Foundation

Age distribution of scientists and engineers: 1974



SOURCE: National Science Foundation

EDUCATIONAL ATTAINMENT

About one-third of the scientists and engineers held graduate degrees in 1974. However, there were substantial differences between scientists and engineers with respect to educational attainment. The proportion of scientists with doctorates was almost seven times that of engineers; however, both scientists and engineers reported similar proportions holding master's degrees, as appendix table B-4 indicates.

Although engineering has traditionally been viewed as a baccalaureate-level endeavor—a fact reinforced by these estimates—over one-half of the scientists also reported a bachelor's degree as their highest academic degree. The proportion of women scientists and engineers holding a doctorate was about one-half that of their male counterparts; however, of the master's degree level their proportion was slightly greater than men.

As a group, Asian scientists and engineers have a higher level of educational attainment than whites. Asian scientists and engineers reported a higher proportion holding a doctorate than did whites except for the fields of psychology and medical science. When both the doctorate and the master's degree-holders are viewed collectively, Asians have a higher proportion than whites, in all fields. A higher proportion of black physicists had achieved a graduate degree than any other racial group.

Scientists and engineers, by highest degree and sex: 1974

[Percent distribution]

Degree level	Scientists		Engineers	
	Men	Women	Men	Women
All degrees	100	100	100	100
Doctorate	29	13	4	2
Master's	21	23	19	26
Bachelor's	50	62	73	71
Other or no degree	1	2	4	(*)

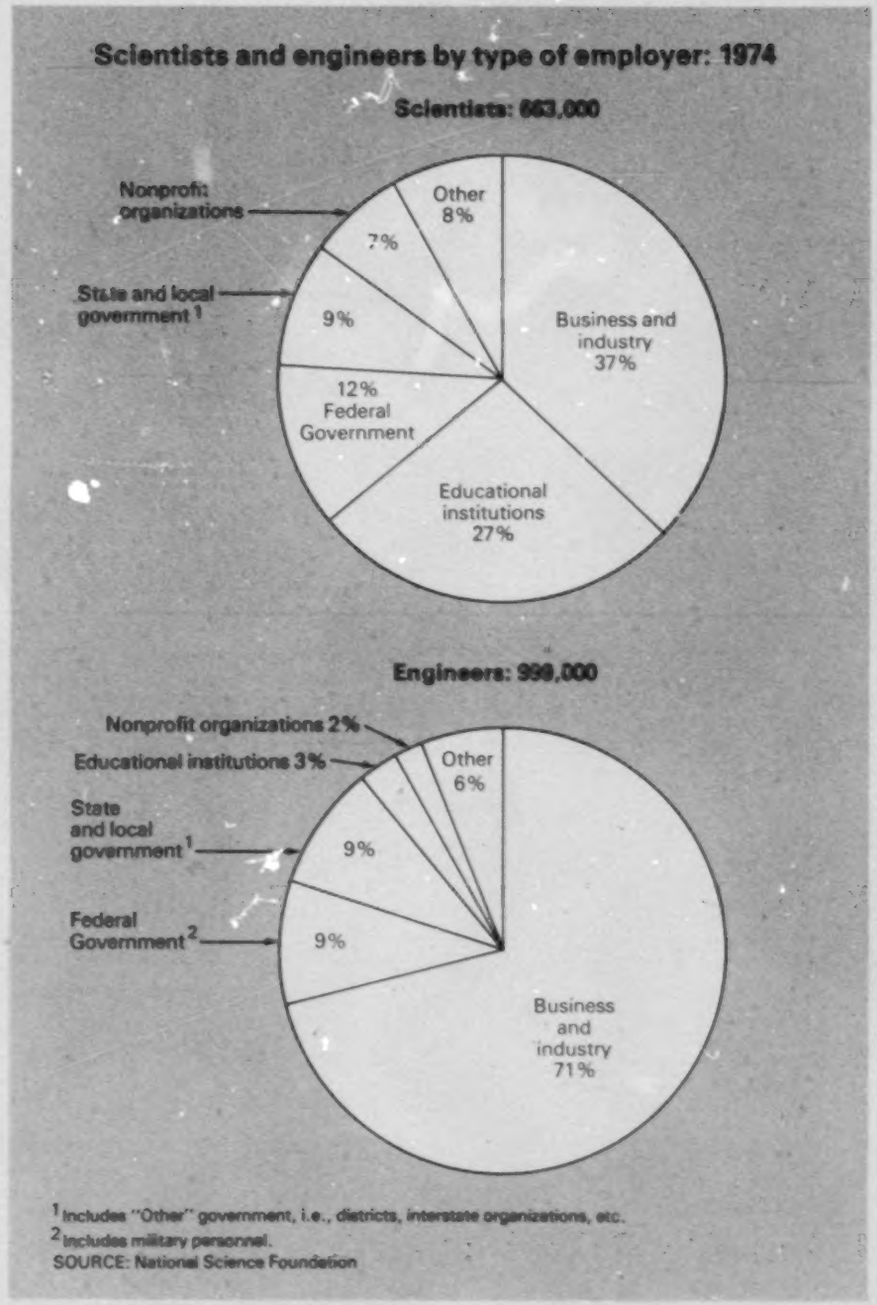
(*) Less than 0.5 percent.
Note: Detail may not add to 100 percent because of rounding.
Source: National Science Foundation.

Employment Characteristics

LABOR FORCE

The size of the S/E labor force in 1974 was estimated to be about 1,700,000 individuals, giving a labor force participation rate of 85 percent for the almost 2 million scientists and engineers. Of those in the labor force, 16,000 were unemployed and seeking employment, thereby producing an unemployment rate of about 1 percent. The scientific labor force was over 650,000; this resulted in a labor force participation rate of 74 percent and an unemployment rate of about 0.9 percent. Engineers, consisting of over 1 million individuals, had a labor force participation rate of 94 percent and an unemployment rate of 1 percent in 1974. This unemployment rate for engineers is about the same as those rates developed by using other sources of employment information, such as the Bureau of Labor Statistics and the Engineer's Joint Council. Women constituted almost 6 percent of the S/E labor force and had an unemployment rate of 1.8 percent—twice that of men. The labor force participation rate for women was 53 percent while men reported an 88 percent participation rate. The unemployment rate for women scientists was 1.9 percent—almost three times that of men (0.7 percent). Women engineers experienced an unemployment rate of 1.7 percent—more than one-half again that of men (1.0 percent).

Minorities made up of about 5 percent of the labor force with both black scientists and engineers and Asians accounting for 2 percent each. The labor force participation rate for minorities was higher than that of whites (85 percent) with blacks reporting 93 percent, Asians 92 percent, and American Indians 90 percent. The unemployment rate for Asians was about the same as for whites, 1 percent; for blacks, it was less than 0.5 percent. The small number of American Indians unemployed precludes the computation of an unemployment rate for that group.



TYPE OF EMPLOYER

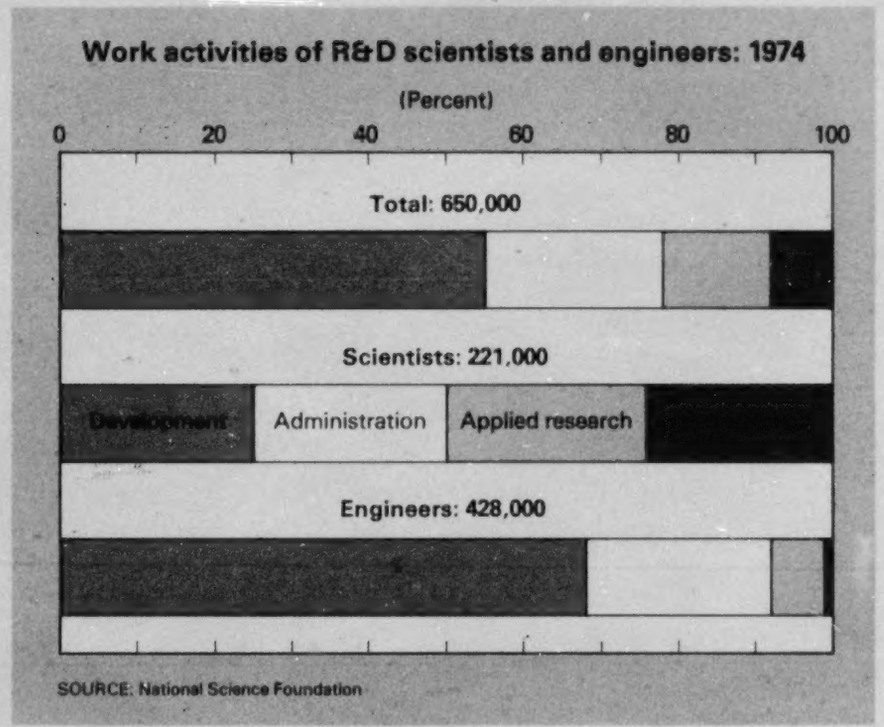
Business and industry employed the largest number of scientists and engineers of any type of employer—37 percent of the scientists and 71 percent of the engineers. Educational institutions provided employment for 27 percent of the scientists while the Federal Government was the second most important employer for engineers in utilizing 9 percent. Physicists, mathematicians, biologists, medical scientists, psychologists, and sociologists were more often found to be employed by an academic institution than by any other type of employer.

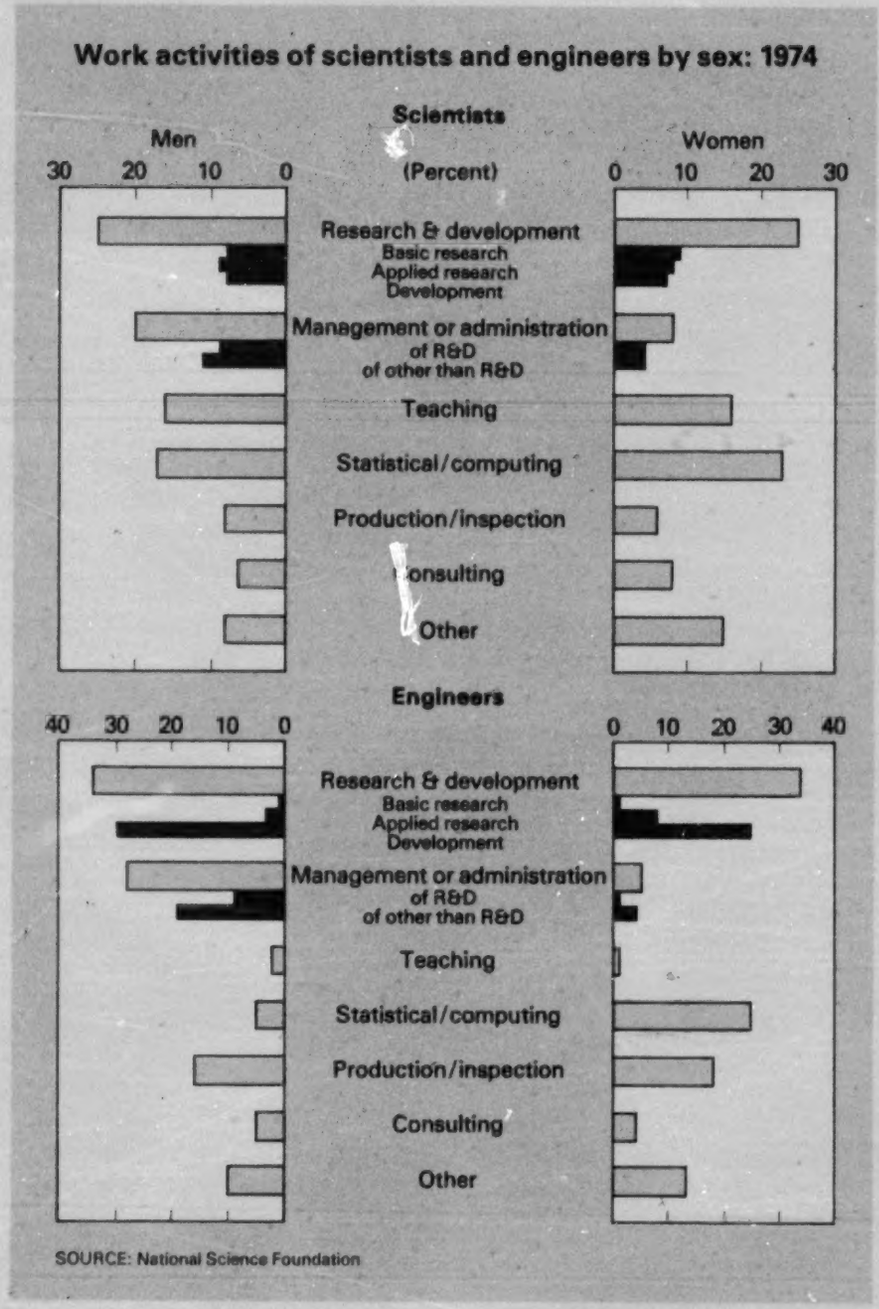
Women engineers, although predominently employed by business and industry, showed a more varied dispersion by type of employer than did men. State and local governments employed 13 percent of the women engineers and 7 percent of the men; nonprofit organizations utilized 4 percent of the women and 2 percent of the men and a higher proportion of women engineers (4 percent) were employed by educational institutions than their male counterparts (3 percent). Most women scientists were employed by business and industry and educational institutions—29 percent and 25 percent, respectively. Nonprofit organizations, the Federal Government, and State and local governments each accounted for about 10 percent of the women scientists.

PRIMARY WORK ACTIVITY

Research and development and R&D administration were the primary work activities of 39 percent of the Nation's scientists and engineers in 1974. These 650,000 individuals—plus the contribution to R&D activities made by scientists and engineers in other primary work activities—represent the efforts of about 530,000 scientists and engineers on a full-time-equivalent basis.[2] Of the 650,000 scientists and engineers primarily engaged in research and development, 55 percent were in development, 23 percent in R&D administration, 14 percent in applied research, and 8 percent in basic research. Scientists were predominant in basic and applied research with the ratios of scientists to engineers being about 10 to 1 and 2 to 1, respectively, while engineers dominate the work activities of development and R&D administration with ratios of scientists to engineers of 1 to 6 and 1 to 2, respectively.

[2] National Science Foundation, *National Patterns of R&D Resources, Funds & Manpower in the United States, 1953-1975* (NSF 75-307) (Washington, D.C. 20402: Supt. of Documents, U.S. Government Printing Office, 1975).





Management or administration of activities other than research and development involved about 15 percent of the total scientists and engineers; 10 percent of the scientists and 18 percent of the engineers. Other activities involving more than 10 percent of the total scientists and engineers included production and inspection, and statistical and computing work. Teaching, although an important work activity for scientists (16 percent), involved a very small proportion of engineers (less than 2 percent).

Over one-half of the physicists, chemists, and oceanographers were involved in R&D activities while research and development involved 30 percent to 40 percent of the atmospheric, biological, agricultural, and medical scientists, and economists. Most statisticians and computer specialists were concerned mainly with statistical and computer activities. Teaching was an important work activity for mathematicians and sociologists.

Women scientists' work activities follow a pattern similar to that of men with regard to the proportion engaged in research and development, teaching, production, and consulting. A greater proportion of men than women were in management and administrative positions and the proportion of women surpasses men in the areas of statistical work, computer activities, and report writing. Women engineers reflect the pattern set by women scientists with a smaller proportion working as managers and administrators. Teaching is often visualized as a work activity in which a high proportion of women participate; and for women sociologists this is true—41 percent reported teaching as their primary work activity. Between 20 percent and 25 percent of women physicists, mathematicians, biologists, and medical scientists were primarily engaged in teaching while 10 percent to 19 percent of women earth scientists, psychologists, and economists reported this their primary activity; all other women reported less than 10 percent.

Geographic Characteristics

The geographic location of scientists and engineers follows closely that of the U.S. population in total. About 45 percent of the scientists and 40 percent of the engineers are situated along the Atlantic Coast in the Census divisions of New England, Middle Atlantic, and South Atlantic. The East North Central division surrounding the Great Lakes was the location of 19 percent of both the scientists and engineers, and the Pacific division, dominated by California, had 14 percent of the scientists and 17 percent of the engineers.

The States of New York and California led the Nation in the number of scientists—each having about 95,000. This was about twice the number reported by the next five largest States: Illinois, Texas, Pennsylvania, Ohio, and Michigan. California has the greatest number of engineers, followed by New York, Pennsylvania, Ohio, Texas, Illinois, and Minnesota.

Geographic distribution of scientists and engineers: 1974

Geographic division	U.S. population	Scientists	Engineers
Total	211,000,000	900,000	1,100,000
	Percent distribution		
All locations	100	100	100
New England	6	8	8
Middle Atlantic	18	20	19
East North Central	19	19	19
West North Central	8	7	6
South Atlantic	16	17	13
East South Central	6	4	8
West South Central	10	7	8
Mountain	4	5	4
Pacific	13	14	17

Note: Detail may not add to 100 percent because of rounding
Source: National Science Foundation

State distribution of scientists and engineers: 1974

{State Figures in Thousands}

Scientists and engineers: 2,000,000

Scientists: 900,000

Engineers: 1,100,000

SOURCE: National Science Foundation

APPENDIXES

A. Technical Notes

B. Detailed Statistical Tables

C. Reproduction of Questionnaires and Reference Lists

APPENDIX A

Technical Notes

Source of Data

The primary inputs to the estimates presented in this report were produced by the Foundation's Manpower Characteristics System consisting of the National Sample, the New Entrants Surveys and the Doctoral Roster. Specific surveys used included the 1974 National Survey of Scientists and Engineers (National Sample); Survey of College-Educated Men and Women—class of 1971 (New Entrants); Survey of College-Educated Men and Women—Class of 1972 (New Entrants); Survey of College Educated Men and Women—Class of 1973 (New Entrants); and the 1973 Survey of Doctoral Scientists and Engineers (Doctoral Roster). Additional inputs were provided by other Foundation surveys such as the 1973 Survey of Earned Doctorates; Survey of Graduate Science Student Support, Fall 1973; Survey of Scientific Activities of Institutions of Higher Education, 1974; Survey of Industrial Research and Development, 1973; other Government data sources such as Bureau of the Census, National Center for Educational Statistics; Bureau of Labor Statistics; and nongovernmental groups such as the American Chemical Society, American Institute of Physics, the College Placement Council, and the American Council on Education.

The National Sample

The 1974 National Survey of Scientists and Engineers was the first in a series of planned longitudinal surveys based on the National Sample. A previous survey, the 1972 Professional, Technical, and Scientific Manpower Survey, was conducted among a nationwide sample of approximately 150,000 persons who were recorded in the 1970 Census of Population as being in the experienced civilian labor force in one of 65 engineering, scientific, or related occupations. Also, the survey included a small sample of persons who had completed four or more years of college but were not in any of the specified occupations. Based on responses in the 1972 survey and on criteria established by the National Science Foundation, approximately 51,000 persons from the 1972 survey sample (excluding the small sample of college graduates) were chosen as the National Sample of the 1974 National Survey of Scientists and Engineers. Survey questionnaires were mailed to this abbreviated sample in February 1974. Data collection activities continued to August 1974. Completed questionnaries were obtained for 87.7 of the sample—approximately 44,000 persons. The 12.3 percent from whom completed questionnaires were not received included persons who either refused to participate, were deceased, or were persons who returned questionnaires with insufficient information to permit processing. In addition, 10.1 percent of the group moved out of S/E fields in 1974.

Therefore, of the original 1,400,000 scientists and engineers whom the sample represented in 1972, 12.3 percent (172,000) did not repsond, and 10.1 percent (148,000) represented those who did not meet the criteria for inclusion as scientists and engineers in 1974. As a result, 1,080,000 scientists and engineers remained in 1974.

National Sample Criteria

A member of a field of science and engineering in 1974 is an individual (1) who had earned a master's degree or higher[1] in a coincident field of study and who regarded himself, based on his total education and experience, as having a coincident profession; or, (2) who had earned a Ph.D. in any field of social or natural science[2] and was employed in a coincident occupation; or, (3) who had earned a bachelor's degree or higher in a coincident field of study, and was employed in a coincident occupation; or, (4) who had earned a bachelor's degree or higher in any field of study, was employed in a coincident occupation, and regarded himself as having a coincident profession; or, (5) whose highest degree[3] was in a coincident field of study[4] and who was employed as a college president, college dean, or manager or administrator of research or development, production or operations[5], or (6) who had earned a bachelor's degree or higher in a coincident field of study,[6] was employed in a related occupation, and regarded himself as having a coincident profession; or, (7) who had earned a bachelor's degree in a coincident field of study since 1969 and regarded himself as having a coincident profession; or, (8) who had earned a bachelor's degree or higher in any field of science[7] and was employed as a college

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[1] Engineers could meet the requirement with a bachelor's degree or higher.

[2] Codes 501-587 and 593 of National Sample list A of appendix C.

[3] At the bachelor's level or higher.

[4] Certain coincident fields of study are common to two fields of science or engineering. Therefore, persons meeting criterion 5 with field of study represented by codes 508 or 526 of National Sample List A of appendix C were classified exclusively as "biological scientists"; those with codes 565 or 568 were classified exclusively as "other physical scientists"; and those with code 581 were classified exclusively as "economists."

[5] Codes 457-459 of National Sample list C of Appendix C.

[6] In addition to a coincident field of study engineers could have earned a bachelor's degree or higher in codes 508, 529, 557, 559-561, 563-568 or National Sample list A of appendix C.

[7] For all fields except economists, codes 501-587 and 591 of National Sample list A of appendix C for economists, codes 557, 558, 575-587, and 593 of National Sample list A of appendix C.

president, college dean, or administrator or manager of research or development, production or operations[8] and who regarded himself as having a coincident profession; or, (9) whose highest degree[9] was in a related field of study and who was employed in a coincident occupation and who regarded himself professionally to be a college president, dean or administrator or manager of research or development, production, or operations[10]. The field "engineers" also includes any individual who failed to meet any of the above 9 criteria but who had completed a minimum of two years of a program of study leading to a bachelor's degree in engineering or a related field of study before 1968 and was employed as an engineer, and regarded himself professionally to be an engineer or a manager or administrator of research or development, production or operations, or who earned an associate degree before 1968, and was employed as an engineer, and regarded himself professionally to be an engineer or a manager or administrator of research or development, production, or operations[11].

Some respondents to the 1974 survey reported "operations research analyst"[12] as their occupation or profession. The National Science Foundation determined that certain of the above criteria should classify these persons as either "mathematicians" or "engineers." Such an individual, therefore, is classified by criteria 3 or 7 as a "mathematician" if he, depending upon the criterion specified, was either employed as, or regarded himself professionally as, an "operations research analyst" and met the requirement of the specific criterion as it related to mathematicians. Likewise, the individual was classified by criteria 3, 4, or 7 as an "engineer" if, depending on the criterion specified, his occupation and/or profession was "operations research analyst" instead of "engineer," and he met all the other requirements of the specified criterion as these related to engineers. In addition, an individual is classified as an engineer if he met none of the above criteria, but had earned a bachelor's degree in a field of study other than one coincident to a field of science or engineering, was employed as a college president, dean, manager or administrator of research or development,[13] and regarded himself professionally as an "operations research analyst."

The estimates of the National Sample were prepared by a ratio estimation procedure, using the weights derived for the 1972 survey. Therefore, no adjustment was made for nonresponse in the 1974 survey. The weighting procedure for the 1972 survey involved first, the preparation of preliminary estimates by weighting the results for each sample person by the reciprocal of the probability of selection. As a second step, these weights were adjusted by applying a factor for each age, sex, and race cell within each of the sample's occupational categories for the 1970 census. Within each of the cells, the factor was computed as the ratio of the 1970 census count to the preliminary estimate. The final weight was the factor multiplied by the original weight of each person. To the extent of correlation between the data being tabluated and the estimated count of persons in the cells are positively correlated, the ratio estimation procedure will improve the reliability of the estimate.

[8] Codes 457-459 of National Sample list C of appendix C.

[9] At the bachelor's level or higher.

[10] Codes 457-459 of National Sample list C of appendix C.

[11] Codes 458 and 459 of National Sample list C of appendix C.

[12] Codes 427 of National Sample list C of appendix C.

[13] Codes 457-459 of National Sample list C of appendix C.

New Entrants Surveys—Classes of 1971, 1972, and 1973

The purpose of the New Entrants Surveys was to estimate the number of new entrants into the S/E labor force since the 1970 decennial census. Information from the Higher Education General Information Survey conducted by the National Center for Educational Statistics provided counts of earned bachelor's degrees conferred in 1971, 1972, and 1973 which were used to establish the population totals for each of the years. The Cooperative Institutional Research Program conducted by the Laboratory for Research on Higher Education, Graduate School of Education, University of California, Los Angeles, (formerly an activity of the American Council on Education) provided the source for the panels from which samples were selected representing the bachelor's degree recipients for each of the years. Information collected at the time of entry into college and from subsequent followup surveys was available for the 1971 and 1972 classes. This information permitted restricting of the samples representing these classes to those individuals who either had obtained a bachelor's degree by 1974 or who were still in attendance at an institution of higher education and majoring in science or engineering. No comparable information was available for the 1973 class, therefore, a random sample of this class was selected to be surveyed.

The respective sizes of the sample for which valid addresses were located were 1971 class, 14,900; 1972 class, 14,700; and 1973 class, 57,000. Questionnaires were mailed to the 1973 class in July 1974 and to the other two classes in September. A followup mailing to all classes took place in November 1974 and the cutoff date was December 27, 1974. Completed questionnaires were received—61 percent of the 1971 sample, 73 percent of the 1972 sample and 43 percent of the 1973 sample. The low rate of return associated with the 1973 sample is attributed to the fact that the content of the questionnaire was directed towards scientists and engineers; therefore, individuals in the arts, humanities, and education did not respond. For each sample case for which a completed questionnaire was obtained the information from the 1974 survey was matched with background data previously collected. Based on the information so collected, individuals meeting the criteria for inclusion were identified. From the 1971 class, 5,100 were included in the tabulations representing 107,000 individuals; the corresponding number for 1972 were 5,700 and 124,000 and for 1973 were 7,700 and 127,000.

New Entrants Criteria

A member of a field of science or engineering in 1974 is an individual who was employed as a scientist or engineer in 1974 and held a bachelor's degree.

Weighting and Estimating Procedures

To develop data representative of scientists and engineers graduating in 1971, 1972, and 1973, samples of college freshmen in 1967, 1968, and 1969 were weighted to approximate national samples of college freshmen by using data from the National Center for Educational Statistics and the number of entering freshmen by institution and sex. Institutions were stratified according to type (public or private), selectivity (average ability of entering students), racial predominance, and size.[14] Data from the Higher Education General Information Survey (HEGIS) were used to weight each sample person twice, first by the ratio of the HEGIS to sample size within an institution and sex, second by the ratio of the HEGIS to weighted sample size by stratification cell and sex. The product of the two weights accurately estimated counts by institution, institution type, and sex.

The availability of background data on each sample person plus information from institutions on test scores, cumulative grade-point average, and degree received allowed for additional corrections in terms of different response rate among different types of individuals. Regression analysis was used to predict response based on total information available. The resulting regression equations were used to generate a weight inversely proportional to the probability of responding. Thus, those who were more likely to respond—e.g., white women with high grade-point averages—received proportionately fewer weights than those who were more unlikely to respond—e.g., black men with low high-school grades. The product of the weights generated by the regression procedure and the institutional weights formed an

[14] Details of the stratification scheme may be found in *American Council on Education Research Reports*, "National Norms for Entering College Freshmen, Fall 1967" (Vol. 2, No. 7); Fall 1968 (Vol. 3, No. 1); and Fall 1969 (Vol. 4, No. 7).

intermediate weight for each sample person. Next, the HEGIS count of Earned Degrees Conferred was used to adjust the above weights for errors in estimation by type of institution, field, and sex.

The Doctoral Roster

The Roster of Doctoral Scientists and Engineers was compiled from a number of sources, including NAS—NRC's Doctorate Records File, an accumulated record of data on doctorate recipients from U.S. institutions; NSF's National Register of Scientific and Technical Personnel, which from 1954 through 1970 collected information on highly qualified personnel in science fields; *American Men and Women in Science*, 12th Edition, and numerous university and college catalogs. The 1973 Roster contained data on approximately 272,000 individuals of whom 252,000 had received S/E doctorates from U.S. institutions, 10,000 were foreign doctorate-holders, and an additional 10,000 were individuals who had received their doctorates in nonscience and nonengineering (non-S/E) areas, but who were subsequently employed in an S/E position.

From this population of doctorate-holders, a sample of approximately 59,000 was selected for the 1973 Survey. This sample was stratified according to (1) category within the 1973 Roster; i.e., U.S. S/E doctorate holders, foreign doctorate-holders, and non-S/E doctorate-holders, (2) sex, (3) size of doctoral institution (according to the number of S/E doctorates awarded), (4) field of doctorate and (5) year of doctorate.

To ensure representativeness of small groups within the population, a variable sampling ratio was used. Thus, adequate representation of small cells within the stratification tables necessitated the inclusion of all available cases in those cells whereas larger cells did not need to be so heavily sampled to yield reliable statistics. Accordingly, as cell-size increased, an increasing number, but decreasing percent, of cases were included in the sample.

From a total population of 272, 234 individuals, a sample of 59,086 was selected, and current addresses for 55,700 of this sample were available. On March 30, 1973, survey forms were mailed to this number of individuals; followup mailings to those who had not yet responded took place on May 17, August 29, and October 17, 1973. The survey was terminated on November 26, 1973.

The survey yielded an overall response rate of 74.5 percent of the total sample and 79.0 percent of those contacted. Of the 59,086 individuals in the total sample, 1,561 were deceased, an additional 3,386 were not able to be contacted, and 11,683 did not respond to the survey, resulting in a total of 42,456 usable responses from members of the sample.

Analysis of response rates by stratification criterion reveal slightly lower rates from individuals holding doctorates from foreign institutions and somewhat lower rates for social scientists, from those who received doctorates between 1958 and 1969 and from those who received doctorates from small institutions. Except for foreign doctorate-holders, however, who were understandingly more difficult to locate, response rates among elements of the stratification table did not deviate markedly from the overall rate.

Weighting and Estimating Procedures

Since the various cells in the sample were not equally represented, it was necessary to assign differential weights to achieve the statistics presented in this report which are estimates of total population; i.e., each response was weighted so that the statistics represent, as nearly as possible, the results which would have been obtained if the entire population had been surveyed.

Synthesis of Data

The estimates produced were primarily based on the five surveys discussed. Those members of the 1974 science and engineering population not directly represented by the five surveys were accounted for by imputation. The characteristics of the National Sample were attributed to the 154,000 nonrespondents and to the 278,000 individuals who had completed four or more years of college, but were not in any of the occupations making up the National Sample. Information from the 1970 decennial census and the 1972 Professional, Technical and Scientific Manpower Survey allowed for a comparison of the subpopulations with those who responded in the 1974 National Sample. From the data reviewed, it is evident that these scientists and engineers have overall characteristics similar to those of the National Sample for whom detailed characteristics were generated. That portion of the 1970 graduates who were in colleges and universities as students, hence not part of the National Sample, were taken into account. This group, about 104,000 individuals, was given the characteristics of the 1971 graduating class in the imputation process (table A-1).

Table A-1.—Sampling errors at the 90-percent level of confidence for scientists and engineers: 1974

Total scientists and engineers

Size of estimate	Sampling error (±)
100	40
200	80
500	190
1,000	380
2,000	740
5,000	1,770
10,000	2,810
20,000	3,930
50,000	6,550
100,000	9,080
200,000	13,140
500,000	20,250
750,000	25,100
1,000,000	28,500
1,200,000	31,390
1,500,000	35,440
1,900,000	38,670

Physical scientists

Size of estimate	Sampling error (±)
100	80
200	120
500	230
1,000	370
2,000	640
5,000	1,360
10,000	2,530
20,000	3,330
50,000	5,510
80,000	6,750
110,000	7,850
130,000	8,390
150,000	8,940
170,000	9,510

Chemists

Size of estimate	Sampling error (±)
100	80
200	110
500	210
1,000	340
2,000	580
5,000	1,230
10,000	2,290
20,000	3,170
50,000	5,190
80,000	6,460
110,000	7,570
130,000	8,070

Physicists and astronomers

Size of estimate	Sampling error (±)
100	80
200	120
500	220
1,000	360
2,000	710
5,000	1,330
7,500	1,920
10,000	2,500
15,000	2,890
20,000	3,250
30,000	3,950
40,000	4,690

Other physical scientists

Size of estimate	Sampling error (±)
100	70
200	100
500	200
750	270
1,000	340
2,000	620
3,000	890
4,000	1,160
5,000	1,440
6,000	1,710
7,000	1,990

Mathematical scientists

Size of estimate	Sampling error (±)
100	60
200	110
500	230
1,000	420
2,000	770
5,000	1,750
10,000	2,770
20,000	3,830
30,000	4,860
40,000	5,700
50,000	6,310
60,000	6,920

Computer specialists

Size of estimate	Sampling error (±)
100	70
200	110
500	240
1,000	420
2,000	730
5,000	1,580
10,000	2,680
20,000	3,620
50,000	5,940
80,000	7,490
110,000	

Engineers

Size of estimate	Sampling error (±)
100	50
200	90
500	220
1,000	400
2,000	730
5,000	1,660
10,000	2,740
20,000	4,270
50,000	6,240
100,000	8,770
200,000	12,540
500,000	19,260
750,000	23,660
1,000,000	26,630

Environmental scientists

Size of estimate	Sampling error (±)
100	80
200	110
500	220
1,000	390
2,000	680
5,000	1,460
10,000	2,590
20,000	3,450
30,000	4,250
40,000	5,010
50,000	5,630

Earth scientists

Size of estimate	Sampling error (±)
100	80
200	110
500	220
1,000	380
2,000	680
5,000	1,460
10,000	2,590
20,000	3,440
30,000	4,250
40,000	5,020

Oceanographers

Size of estimate	Sampling error (±)
100	70
200	110
500	230
1,000	420
1,500	610

Atmospheric scientists

Size of estimate	Sampling error (±)
100	80
200	130
500	250
1,000	440
2,000	810
3,000	1,160
4,000	1,520

Life scientists

Size of estimate	Sampling error (±)
100	80
200	140
500	310
1,000	590
2,000	1,110
5,000	2,500
10,000	4,180
20,000	4,970
50,000	7,880
100,000	11,090
150,000	13,470

Biological scientists

Size of estimate	Sampling error (±)
100	70
200	120
500	270
1,000	510
2,000	940
5,000	2,210
10,000	3,060
20,000	4,400
50,000	7,200
75,000	8,640
100,000	9,920

Agricultural scientists

Size of estimate	Sampling error (±)
100	100
200	170
500	390
1,000	710
2,000	1,390
5,000	2,730
10,000	3,780
20,000	5,660
50,000	8,770

Medical scientists

Size of estimate	Sampling error (±)
100	110
200	190
500	440
1,000	840
2,000	1,640
5,000	2,910
10,000	4,160
15,000	5,360

Psychologists

Size of estimate	Sampling error (±)
100	70
200	120
500	260
1,000	480
2,000	870
5,000	1,990
10,000	2,940
20,000	4,140
50,000	6,820
75,000	8,290

Social scientists

Size of estimate	Sampling error (±)
100	60
200	120
500	300
1,000	570
2,000	1,030
5,000	2,370
10,000	3,210
20,000	4,650
50,000	7,580
100,000	10,460
150,000	12,840

Economists

Size of estimate	Sampling error (±)
100	80
200	150
500	350
1,000	670
2,000	1,290
5,000	2,640
10,000	3,610
20,000	5,440
50,000	8,400

Sociologists/anthropologists

Size of estimate	Sampling error (±)
100	60
200	120
500	300
1,000	540
2,000	940
5,000	2,150
10,000	3,070
20,000	4,380
50,000	7,160

Other social scientists

Size of estimate	Sampling error (±)
100	60
200	120
500	290
1,000	510
2,000	880
5,000	1,930
10,000	2,950
20,000	4,150
50,000	6,780
80,000	8,500

Source: National Science Foundation

APPENDIX B

Detailed Tables

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Table B-1.—Scientists and engineers by field, employment status, and sex: 1974

Field	Total			Labor force			Unemployed, seeking			Outside labor force		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total, all fields	1,973,200	1,788,000	185,200	1,678,100	1,580,300	97,800	16,000	14,200	1,800	295,000	207,700	87,400
Physical scientists	188,300	169,900	18,400	157,400	142,400	15,000	1,800	1,200	600	30,800	27,500	3,300
Chemists	138,000	122,400	15,600	114,700	101,600	13,100	1,400	800	600	23,300	20,800	2,400
Physicists/astronomers	42,400	39,900	2,500	35,100	33,400	1,600	400	400	(1)	7,400	6,500	900
Other physical scientists	7,800	7,500	300	7,600	7,400	200	(1)	(1)	(1)	200	200	(1)
Mathematical scientists	60,400	45,200	15,200	45,200	38,200	7,000	400	300	100	15,200	7,000	8,200
Mathematicians	43,500	32,500	10,900	32,500	27,500	5,000	300	200	100	10,900	5,000	5,900
Statisticians	16,900	12,600	4,200	12,600	10,700	2,000	100	100	(1)	4,200	2,000	2,300
Computer specialists	125,500	101,300	24,200	122,600	101,200	21,400	800	500	300	2,900	(1)	2,800
Environmental scientists	52,000	49,300	2,700	44,500	42,700	1,800	400	400	(1)	7,500	6,600	900
Earth scientists	45,600	43,000	2,600	38,500	36,800	1,700	300	300	(1)	7,100	6,200	900
Oceanographers	2,000	2,000	(1)	1,800	1,800	(1)	100	100	(1)	200	200	(1)
Atmospheric scientists	4,300	4,200	100	4,100	4,100	100	(1)	(1)	(1)	200	200	(1)
Engineers	1,071,800	1,064,100	7,600	1,008,700	1,003,400	5,300	10,000	9,900	100	63,000	60,700	2,300
Life scientists	193,900	159,800	34,100	137,100	118,600	18,500	1,200	1,000	200	56,800	41,200	15,600
Biological scientists	118,000	91,300	26,600	69,400	56,700	12,700	800	600	200	48,600	34,700	13,900
Agricultural scientists	57,900	56,200	1,600	50,800	50,500	300	300	300	(1)	7,100	5,700	1,400
Medical scientists	18,100	12,200	5,900	16,900	11,400	5,500	100	100	(1)	1,200	800	400
Psychologists	94,700	67,700	27,100	62,000	46,600	15,400	600	200	400	32,700	21,000	11,700
Social scientists	186,700	130,800	55,900	100,600	87,200	13,400	800	700	200	86,100	43,600	42,500
Economists	54,600	49,600	5,000	39,300	36,000	3,300	200	100	(1)	15,300	13,700	1,700
Sociologists/anthropologists	50,400	26,800	23,600	22,300	17,400	4,900	300	200	100	28,100	9,400	18,700
Other social scientists	81,700	54,400	27,300	39,100	33,900	5,200	400	300	100	42,600	20,500	22,100

(1) Too few cases to estimate

Note: Detail may not add to total because of rounding

Source: National Science Foundation

Table B-2.—Scientists and engineers by field, labor force status, and race: 1974

Field	Total					
	Total	White	Black	American Indian	Asian	Other
Total, all fields	1,973,200	1,886,200	31,700	1,700	36,500	17,000
Physical scientists	188,300	178,600	3,500	300	4,600	1,300
Chemists	138,000	130,800	3,000	300	3,100	900
Physicists/astronomers	42,400	40,300	300	(')	1,400	400
Other physical scientists	7,800	7,500	300	(')	100	(')
Mathematical scientists	60,400	56,800	1,900	(')	1,300	300
Mathematicians	43,500	40,900	1,300	(')	900	200
Statisticains	16,900	15,900	500	(')	400	100
Computer specialists	125,500	119,800	2,500	100	2,400	700
Environmental scientists	52,000	51,000	100	100	500	400
Earth scientists	45,600	44,700	100	100	400	300
Oceanographers	2,000	2,000	(')	(')	(')	(')
Atmospheric scientists	4,300	4,300	(')	(')	(')	(')
Engineers	1,071,800	1,034,000	9,000	500	20,000	8,000
Life scientists	193,900	184,200	3,500	100	2,700	3,300
Biological scientists	118,000	110,700	2,800	100	2,100	2,200
Agricultural scientists	57,900	56,100	400	(')	300	900
Medical scientists	18,100	17,400	200	(')	300	200
Psychologists	94,700	89,700	1,600	100	2,600	800
Social scientists	186,700	171,700	10,200	500	2,200	2,100
Economists	54,600	51,900	1,400	100	800	500
Sociologists/anthropologists	50,400	45,400	3,900	(')	200	900
Other social scientists	81,700	74,400	4,800	500	1,200	700

Field	Labor force					
	Total	White	Black	American Indian	Asian	Other
Total, all fields	1,678,100	1,598,600	29,600	1,600	33,700	14,700
Physical scientists	157,400	149,000	3,300	300	3,800	1,000
Chemists	114,700	108,600	2,800	300	2,500	600
Physicists/astronomers	35,100	33,000	300	(')	1,300	400
Other physical scientists	7,600	7,300	300	(')	100	(')
Mathematical scientists	45,200	4,400	1,500	(')	1,000	200
Mathematicians	32,500	30,700	1,000	(')	600	200
Statisticians	12,600	11,800	500	(')	400	(')
Computer specialists	122,600	117,200	2,500	100	2,300	600
Environmental scientists	44,500	43,500	100	100	500	400
Earth scientists	38,500	37,700	100	100	400	300
Oceanographers	1,800	1,800	(')	(')	(')	(')
Atmospheric scientists	4,100	4,100	(')	(')	(')	(')
Engineers	1,008,700	972,400	8,300	400	20,000	7,700
Life scientists	137,100	129,800	2,800	100	2,200	2,300
Biological scientists	69,400	64,400	2,200	100	1,500	1,200
Agricultural scientists	50,800	49,000	400	(')	300	900
Medical scientists	16,900	16,300	200	(')	300	100
Psychologists	62,000	57,800	1,300	100	3,300	500
Social scientists	100,600	86,500	9,900	500	1,700	2,000
Economists	39,300	36,500	1,400	100	800	500
Sociologists/anthropologists	22,300	17,300	3,900	(')	200	900
Other social scientists	39,100	32,700	4,600	500	700	600

Field	Unemployed, seeking					
	Total	White	Black	American Indian	Asian	Other
Total, all fields	16,000	15,400	100	(')	300	100
Physical scientists	1,800	1,700	(')	(')	100	(')
Chemists	1,400	1,300	(')	(')	100	(')
Physicists/astronomers	400	400	(')	(')	(')	(')
Other physical scientists	(')	(')	(')	(')	(')	(')
Mathematical scientists	400	400	(')	(')	(')	(')
Mathematicians	300	300	(')	(')	(')	(')
Statisticians	100	100	(')	(')	(')	(')
Computer specialists	800	800	(')	(')	(')	(')
Environmental scientists	400	400	(')	(')	(')	(')
Earth scientists	300	300	(')	(')	(')	(')
Oceanographers	100	100	(')	(')	(')	(')
Atmospheric scientists	(')	(')	(')	(')	(')	(')
Engineers	10,000	9,700	100	(')	100	100
Life scientists	1,200	1,100	(')	(')	100	(')
Biological scientists	800	700	(')	(')	(')	(')
Agricultural scientists	300	200	(')	(')	100	(')
Medical scientists	100	100	(')	(')	(')	(')
Psychologists	600	500	(')	(')	(')	(')
Social scientists	800	800	(')	(')	(')	(')
Economists	200	200	(')	(')	(')	(')
Sociologists/anthropologists	300	300	(')	(')	(')	(')
Other social scientists	400	400	(')	(')	(')	(')

Field	Outside labor force					
	Total	White	Black	American Indian	Asian	Other
Total, all fields	295,000	287,600	2,200	200	2,800	2,300
Physical scientists	30,800	29,600	200	(')	700	300
Chemists	23,300	22,000	200	(')	700	300
Physicists/astronomers	7,400	7,300	(')	(')	100	(')
Other physical scientists	200	200	(')	(')	(')	(')
Mathematical scientists	15,200	14,300	400	100	300	100
Mathematicians	10,900	10,200	400	(')	300	(')
Statisticians	4,200	4,100	(')	(')	(')	100
Computer specialists	2,900	2,600	(')	(')	100	100
Environmental scientists	7,500	7,500	(')	(')	(')	(')
Earth scientists	7,100	7,100	(')	(')	(')	(')
Oceanographers	200	200	(')	(')	(')	(')
Atmospheric scientists	200	200	(')	(')	(')	(')
Engineers	63,000	62,000	300	100	300	400
Life scientists	56,800	54,500	700	(')	600	1,000
Biological scientists	48,600	46,300	700	(')	600	1,000
Agricultural scientists	7,100	7,100	(')	(')	(')	(')
Medical scientists	1,200	1,100	(')	(')	(')	(')
Psychologists	32,700	31,900	300	(')	300	300
Social scientists	86,100	85,200	300	(')	500	100
Economists	15,300	15,300	(')	(')	(')	(')
Sociologists/anthropologists	28,100	28,100	(')	(')	(')	(')
Other social scientists	42,600	41,700	300	(')	500	100

(') Too few cases to estimate
Note: Detail may not add to total because of rounding
Source: National Science Foundation

Table B-3.—Scientists and engineers by field, sex, and age: 1974

Field and sex	Total	24 and under	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 and over
Total all fields	1,973,200	244,200	368,900	254,900	245,700	227,100	218,300	176,200	110,300	71,600	37,800	18,100
Men	1,788,000	186,500	306,600	236,400	234,000	218,000	210,800	169,200	105,800	67,800	35,700	17,300
Women	185,200	57,700	62,400	18,500	11,700	9,200	7,600	7,000	4,500	3,800	2,100	800
Physical scientists	188,300	18,300	26,600	29,000	28,100	21,900	20,600	18,100	11,900	7,700	4,200	19,000
Men	169,900	12,400	23,100	26,500	26,200	20,600	19,500	17,000	11,500	7,300	4,000	19,000
Women	18,400	5,900	3,500	2,600	1,900	1,300	1,100	1,000	300	400	200	(')
Chemists	138,000	14,800	19,000	19,500	18,900	15,400	15,600	14,400	9,300	6,500	3,400	1,400
Men	122,400	9,700	15,900	17,100	17,400	14,300	14,600	13,500	9,000	6,200	3,200	1,300
Women	15,600	5,000	3,100	2,300	1,500	1,000	1,000	900	300	300	200	(')
Physicists/astronomers	42,400	3,500	7,000	8,200	7,500	5,200	3,800	3,000	2,000	1,100	600	500
Men	39,900	2,600	6,600	8,000	7,200	5,000	3,600	2,900	1,900	1,000	600	500
Women	2,500	900	400	200	300	200	100	200	100	100	(')	(')
Other physical scientists	7,800	(')	600	1,400	1,600	1,200	1,300	700	700	100	100	100
Men	7,500	(')	500	1,300	1,500	1,200	1,300	700	700	100	100	100
Women	300	(')	100	100	100	(')	(')	(')	(')	(')	(')	(')
Mathematical scientists	60,400	16,000	8,600	10,300	7,100	5,600	4,700	2,500	2,100	2,300	800	400
Men	45,200	11,800	4,800	8,000	6,000	4,900	3,600	1,900	1,500	1,800	600	300
Women	15,200	4,200	3,800	2,300	1,100	700	1,100	600	600	500	300	(')
Mathematicians	43,500	12,800	4,700	7,900	5,200	3,900	3,800	1,500	1,300	1,500	600	200
Men	32,500	9,700	2,300	6,200	4,200	3,400	2,800	1,200	1,000	1,200	400	200
Women	10,900	3,200	2,400	1,700	1,000	500	1,000	300	300	300	200	(')
Statisticians	16,900	3,200	3,900	2,400	1,900	1,700	900	1,000	800	800	200	200
Men	12,600	2,100	2,500	1,800	1,800	1,500	800	700	600	600	200	100
Women	4,200	1,100	1,400	600	100	200	100	300	300	200	100	(')
Computer specialists	125,500	23,800	39,200	23,300	14,800	12,100	7,400	2,900	1,400	400	200	100
Men	101,300	16,300	28,300	19,900	13,800	11,600	6,900	2,600	1,400	300	100	100
Women	24,200	7,500	10,900	3,400	1,000	500	500	300	(')	100	(')	100
Environmental scientists	52,000	6,900	9,200	5,100	5,600	7,400	6,400	5,500	2,900	2,100	700	300
Men	49,300	6,300	7,800	5,000	5,500	7,200	6,300	5,200	2,900	2,000	700	300
Women	2,700	600	1,400	100	(')	200	(')	300	(')	100	(')	(')
Earth scientists	45,600	6,900	8,800	4,200	4,300	6,500	5,800	4,300	2,200	1,900	500	200
Men	43,000	6,300	7,400	4,100	4,300	6,300	5,700	4,100	2,200	1,800	500	200
Women	2,600	600	1,300	100	(')	200	(')	200	(')	100	(')	(')
Oceanographers	2,000	(')	200	400	600	100	200	100	100	(')	100	(')
Men	2,000	(')	200	400	600	100	200	100	100	(')	100	(')
Women	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')
Atmospheric scientists	4,300	(')	200	500	600	800	400	1,000	600	100	(')	(')
Men	4,200	(')	200	500	600	800	400	1,000	600	100	(')	(')
Women	100	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')
Engineers	1,071,800	70,100	163,000	134,200	145,200	140,900	145,100	117,500	72,300	46,900	25,000	11,600
Men	1,064,100	68,500	159,900	133,300	144,800	140,500	144,700	117,200	72,200	46,600	24,800	11,600
Women	7,600	1,600	3,000	900	400	400	400	300	200	300	200	(')
Life scientists	193,900	36,000	43,200	23,100	22,400	20,100	16,600	12,300	9,900	5,900	2,800	1,600
Men	159,800	27,200	32,400	19,300	19,200	17,700	15,500	10,800	8,700	5,000	2,500	1,500
Women	34,100	8,800	10,800	3,700	3,200	2,400	1,100	1,500	1,100	1,000	300	100
Biological scientists	118,000	32,400	32,500	13,000	10,300	8,700	7,800	4,700	4,300	2,500	1,200	600
Men	91,300	23,700	22,800	10,300	9,000	7,400	7,100	3,800	3,500	2,200	1,000	600
Women	26,600	8,700	9,700	2,700	1,300	1,200	700	900	800	300	200	(')
Agricultural scientists	57,900	3,600	9,400	6,900	8,800	8,300	7,000	5,500	3,900	2,300	1,400	900
Men	56,200	3,500	8,900	6,800	8,000	8,300	7,000	5,400	3,900	2,300	1,300	900
Women	1,600	100	500	100	800	(')	(')	(')	(')	(')	100	(')
Medical scientists	18,100	(')	1,300	3,200	3,300	3,100	1,800	2,100	1,700	1,100	300	200
Men	12,200	(')	700	2,300	2,200	1,900	1,400	1,600	1,400	400	200	100
Women	5,900	(')	600	900	1,000	1,200	400	600	300	600	100	(')
Psychologists	94,700	22,700	23,600	11,500	8,500	7,900	7,700	5,900	3,100	1,900	1,200	700
Men	67,700	16,100	16,300	8,800	6,400	5,800	5,900	4,500	2,000	1,000	500	300
Women	27,100	6,600	7,300	2,700	2,100	2,100	1,800	1,400	1,100	900	600	300
Social scientists	186,700	50,400	55,600	18,400	14,000	11,300	9,900	11,500	6,700	4,400	3,000	1,500
Men	130,800	28,000	33,900	15,600	12,000	9,700	8,400	10,000	5,600	3,800	2,500	1,400
Women	55,900	22,300	21,700	2,800	2,000	1,600	1,500	1,500	1,100	700	400	200
Economists	54,600	10,600	9,600	6,800	5,400	5,000	4,000	5,800	2,600	2,100	1,600	1,000
Men	49,600	9,700	8,500	5,800	5,200	4,600	3,800	5,300	2,400	2,000	1,300	1,000
Women	5,000	900	1,100	1,000	300	400	200	400	300	100	300	(')
Sociologists/anthropologists	50,400	15,400	16,500	5,200	3,500	2,300	2,200	2,700	1,200	1,000	200	200
Men	26,800	6,400	6,800	4,000	2,500	1,600	1,500	2,200	900	700	100	200
Women	23,600	9,100	9,700	1,200	1,000	700	700	500	300	300	(')	(')
Other social scientists	81,700	24,300	29,500	6,500	5,000	4,000	3,700	3,000	2,800	1,300	1,200	300
Men	54,400	12,000	18,600	5,800	4,300	3,500	3,100	2,500	2,300	1,100	1,100	200
Women	27,300	12,400	10,900	700	700	500	600	600	500	200	100	200

Table B-4.—Scientists and engineers by field, sex, and highest degree: 1974

Field and sex	Total	Doctorate	Master's	Bachelor's	Associate	Other	No degree
Total, all fields	1,973,200r	274,100	393,100	1,255,000	14,300	11,800	24,800
Men	1,788,000	251,100	350,100	1,139,500	14,300	8,200	24,800
Women	185,200	23,100	43,000	115,600	(')	3,600	(')
Physical scientists	188,300	69,400	34,700	83,500	(')	600	(')
Men	169,900	66,200	30,500	72,500	(')	600	(')
Women	18,400	3,200	4,100	11,000	(')	(')	(')
Chemists	138,000	45,600	22,800	68,900	(')	600	(')
Men	122,400	43,000	20,000	58,800	(')	600	(')
Women	15,600	2,600	2,800	10,200	(')	(')	(')
Physicists/astronomers	42,400	21,400	9,600	11,400	(')	(')	(')
Men	39,900	20,800	8,500	10,700	(')	(')	(')
Women	2,500	600	1,200	700	(')	(')	(')
Other physical scientists	7,800	2,400	2,200	3,200	(')	(')	(')
Men	7,500	2,400	2,100	3,100	(')	(')	(')
Women	300	(')	100	100	(')	(')	(')
Mathematical scientists	60,400	15,500	17,300	27,200	(')	300	(')
Men	45,200	14,400	14,300	16,200	(')	300	(')
Women	15,200	1,100	3,000	11,100	(')	(')	(')
Mathematicians	43,500	12,100	12,800	18,300	(')	200	(')
Men	32,500	11,300	10,600	10,500	(')	200	(')
Women	10,900	800	2,200	7,800	(')	(')	(')
Statisticians	16,900	3,400	4,500	8,900	(')	100	(')
Men	12,600	3,100	3,700	5,700	(')	100	(')
Women	4,200	200	800	3,200	(')	(')	(')
Computer specialists	125,500	3,800	26,700	94,600	(')	500	(')
Men	101,300	3,500	23,800	73,600	(')	300	(')
Women	24,200	200	2,800	20,900	(')	200	(')
Environmental scientists	52,000	12,400	14,400	25,000	(')	100	(')
Men	49,300	12,100	13,300	23,800	(')	100	(')
Women	2,700	300	1,100	1,300	(')	(')	(')
Earth scientists	45,600	10,100	12,500	23,000	(')	100	(')
Men	43,000	9,800	11,300	21,700	(')	100	(')
Women	2,600	300	1,100	1,300	(')	(')	(')
Oceanographers	2,000	1,300	500	200	(')	(')	(')
Men	2,000	1,300	600	200	(')	(')	(')
Women	(')	(')	(')	(')	(')	(')	(')
Atmospheric scientists	4,300	1,100	1,400	1,800	(')	(')	(')
Men	4,200	1,000	1,400	1,800	(')	(')	(')
Women	100	100	(')	(')	(')	(')	(')
Engineers	1,071,800	43,200	203,000	782,200	14,300	4,200	24,800
Men	1,064,100	43,000	201,000	776,800	14,300	4,200	24,800
Women	7,600	200	2,000	5,400	(')	(')	(')
Life scientists	193,900	66,200	35,200	88,100	(')	4,500	(')
Men	159,800	58,300	27,300	72,700	(')	1,500	(')
Women	34,100	7,900	7,900	15,400	(')	2,900	(')
Biological scientists	118,000	42,200	21,300	53,200	(')	1,300	(')
Men	91,300	35,800	15,300	39,000	(')	1,200	(')
Women	26,600	6,400	5,900	14,200	(')	100	(')
Agricultural scientists	57,900	12,100	10,600	34,900	(')	300	(')
Men	56,200	11,900	10,300	33,800	(')	300	(')
Women	1,600	200	300	1,200	(')	(')	(')
Medical scientists	18,100	11,900	3,300	(')	(')	2,800	(')
Men	12,200	10,600	1,600	(')	(')	(')	(')
Women	5,900	1,300	1,700	(')	(')	2,800	(')
Psychologists	94,700	32,800	27,100	34,500	(')	400	(')
Men	67,700	26,100	15,700	25,600	(')	200	(')
Women	27,100	6,700	11,300	8,900	(')	100	(')
Social scientists	186,700	30,800	34,900	119,800	(')	1,200	(')
Men	130,800	27,400	24,300	78,300	(')	900	(')
Women	55,900	3,400	10,600	41,500	(')	300	(')
Economists	54,600	10,800	12,200	31,000	(')	600	(')
Men	49,600	10,100	11,000	28,000	(')	500	(')
Women	5,000	700	1,100	3,000	(')	100	(')
Sociologists/anthropologists	50,400	8,300	8,200	33,700	(')	200	(')
Men	26,800	6,700	3,900	16,100	(')	(')	(')
Women	23,600	1,600	4,400	17,500	(')	100	(')
Other social scientists	81,700	11,600	14,500	55,200	(')	400	(')
Men	54,400	10,500	9,400	34,200	(')	300	(')
Women	27,300	1,100	5,100	2,100	(')	100	(')

(') Too few cases to estimate.

Note: Detail may not add to total because of rounding.

Source: National Science Foundation.

Table B-5.—Scientists and engineers by field, highest degree, and race: 1974

Field and highest degree	Total	White	Black	American Indian	Asian	Other
Total, all fields	1,973,200	1,886,200	31,700	1,700	36,500	17,000
Doctorate	274,100	257,000	2,700	100	11,300	3,000
Master's	393,100	362,900	10,100	600	14,000	4,600
Bachelor's	1,255,000	1,216,600	17,600	900	10,700	9,200
Other	50,900	49,800	300	100	500	200
Physical scientists	188,300	178,600	3,500	300	4,600	1,300
Doctorate	69,400	65,600	600	(')	3,200	100
Master's	34,700	33,100	300	100	1,000	100
Bachelor's	83,500	79,300	2,600	200	400	1,000
Other	600	600	(')	(')	(')	(')
Chemists	138,000	130,800	3,000	300	3,100	900
Doctorate	45,600	43,100	500	(')	2,000	100
Master's	22,800	21,700	200	100	800	100
Bachelor's	68,900	65,400	2,300	200	400	700
Other	600	600	(')	(')	(')	(')
Physicists/astronomers	42,400	40,300	300	(')	1,400	400
Doctorate	21,400	20,100	100	(')	1,100	100
Master's	9,600	9,300	100	(')	200	(')
Bachelor's	11,400	10,900	100	(')	(')	300
Other	(')	(')	(')	(')	(')	(')
Other physical scientists	7,800	7,500	300	(')	100	(')
Doctorate	2,400	2,300	(')	(')	(')	(')
Master's	2,200	2,200	(')	(')	(')	(')
Bachelor's	3,200	3,000	200	(')	(')	(')
Other	(')	(')	(')	(')	(')	(')
Mathematical scientists	60,400	56,800	1,900	(')	1,300	300
Doctorate	15,500	13,900	500	(')	900	200
Master's	17,300	16,200	700	(')	300	200
Bachelor's	27,200	26,300	700	(')	100	(')
Other	300	300	(')	(')	(')	(')
Mathematicians	43,500	40,900	1,300	(')	900	200
Doctorate	12,100	11,000	300	(')	700	100
Master's	12,800	12,000	600	(')	200	100
Bachelor's	18,300	17,600	500	(')	100	(')
Other	200	200	(')	(')	(')	(')
Statisticians	16,900	15,900	500	(')	400	100
Doctorate	3,400	2,900	200	(')	200	100
Master's	4,500	4,200	100	(')	100	(')
Bachelor's	8,900	8,700	200	(')	(')	(')
Other	100	100	(')	(')	(')	(')
Computer specialists	125,500	119,800	2,500	100	2,400	700
Doctorate	3,800	3,600	(')	(')	200	(')
Master's	26,700	25,400	400	(')	600	200
Bachelor's	94,600	90,400	2,100	100	1,600	400
Other	500	500	(')	(')	(')	(')
Environmental scientists	52,000	51,000	100	100	500	400
Doctorate	12,400	12,100	(')	(')	300	(')
Master's	14,400	14,300	(')	(')	100	(')
Bachelor's	25,000	24,500	(')	100	100	400
Other	100	100	(')	(')	(')	(')
Earth scientists	45,600	44,700	100	100	400	300
Doctorate	10,100	9,800	(')	(')	300	(')
Master's	12,500	12,300	(')	(')	100	(')
Bachelor's	23,000	22,500	(')	100	100	300
Other	100	100	(')	(')	(')	(')
Oceanographers	2,000	2,000	(')	(')	(')	(')
Doctorate	1,300	1,200	(')	(')	(')	(')
Master's	600	600	(')	(')	(')	(')
Bachelor's	200	200	(')	(')	(')	(')
Other	(')	(')	(')	(')	(')	(')
Atmospheric scientists	4,300	4,300	(')	(')	(')	(')
Doctorate	1,100	1,100	(')	(')	(')	(')
Master's	1,400	1,400	(')	(')	(')	(')
Bachelor's	1,800	1,800	(')	(')	(')	(')
Other	(')	(')	(')	(')	(')	(')

Engineers	1,071,800	1,034,500	8,500	500	20,200	8,100
Doctorate	43,200	39,000	400	(*)	3,100	600
Master's	203,000	187,400	3,300	200	9,400	2,800
Bachelor's	782,200	765,600	4,600	100	7,300	4,600
Other	43,400	42,500	200	100	400	100
Life scientists	193,900	184,200	3,500	100	2,700	3,300
Doctorate	66,200	61,300	600	(*)	2,400	1,900
Master's	35,200	32,100	2,400	(*)	200	500
Bachelor's	88,100	86,600	500	100	100	900
Other	4,500	4,300	(*)	(*)	100	100
Biological scientists	118,000	110,700	2,800	100	2,100	2,200
Doctorate	42,200	38,000	500	(*)	1,900	1,800
Master's	21,300	19,200	2,000	(*)	100	(*)
Bachelor's	53,200	52,400	300	(*)	(*)	400
Other	1,300	1,200	(*)	(*)	(*)	(*)
Agricultural scientists	57,900	56,100	400	(*)	300	900
Doctorate	12,100	11,700	(*)	(*)	300	(*)
Master's	10,600	9,900	300	(*)	(*)	500
Bachelor's	34,900	34,300	100	(*)	(*)	500
Other	300	300	(*)	(*)	(*)	(*)
Medical scientists	18,100	17,400	200	(*)	300	200
Doctorate	11,900	11,600	100	(*)	200	100
Master's	3,300	3,000	100	(*)	100	(*)
Bachelor's	(*)	(*)	(*)	(*)	(*)	(*)
Other	2,800	2,700	(*)	(*)	(*)	100
Psychologists	94,700	89,700	1,600	100	2,600	800
Doctorate	32,800	32,100	300	(*)	300	100
Master's	27,100	24,200	1,000	(*)	1,500	300
Bachelor's	34,500	33,000	300	(*)	800	400
Other	400	400	(*)	(*)	(*)	(*)
Social scientists	186,700	171,700	10,200	500	2,200	2,100
Doctorate	30,800	29,500	400	(*)	800	(*)
Master's	34,900	30,200	2,900	300	1,000	500
Bachelor's	119,800	110,900	6,800	200	400	1,600
Other	1,200	1,100	(*)	(*)	(*)	(*)
Economists	54,600	51,900	1,400	100	800	500
Doctorate	10,800	10,200	100	(*)	500	(*)
Master's	12,200	11,300	400	(*)	200	100
Bachelor's	31,000	29,700	900	(*)	(*)	300
Other	600	600	(*)	(*)	(*)	(*)
Sociologists/anthropologists	50,400	45,400	3,900	(*)	200	900
Doctorate	8,300	8,000	100	(*)	200	(*)
Master's	8,200	7,000	1,100	(*)	(*)	200
Bachelor's	33,700	30,300	2,700	(*)	(*)	700
Other	200	200	(*)	(*)	(*)	(*)
Other social scientists	81,700	74,400	4,800	500	1,200	700
Doctorate	11,600	11,300	100	(*)	100	(*)
Master's	14,500	11,900	1,400	300	800	200
Bachelor's	55,200	50,900	3,200	200	400	600
Other	400	400	(*)	(*)	(*)	(*)

(*) Too few to estimate.

Note: Detail may not add to total because of rounding.

Source: National Science Foundation

Table B-6.—Scientists and engineers by field, sex, and type of employer: 1974

Field and sex	Total	Business and industry	Educational institutions	Nonprofit organizations	Federal Government	Military	State and local government	Other government	Other	No report
Total, all fields	1,662,200	959,000	205,300	65,800	157,400	8,400	120,500	26,800	110,500	8,400
Men	1,566,100	929,600	182,000	55,900	147,600	8,200	111,500	25,600	98,700	7,100
Women	96,000	29,400	23,300	9,900	9,800	300	9,000	1,200	11,900	1,300
Physical scientists	155,600	69,900	34,900	8,100	14,300	500	7,800	900	18,200	900
Men	141,200	66,200	32,200	7,200	13,400	500	7,200	800	13,000	800
Women	14,400	3,700	2,800	900	900	(*)	600	100	5,200	100
Chemists	113,300	62,100	19,800	4,200	6,200	400	5,800	800	13,300	800
Men	100,800	58,500	17,500	3,500	5,500	400	5,300	600	8,900	700
Women	12,500	3,600	2,300	700	700	(*)	500	100	4,400	100
Physicists/astronomers	34,600	6,100	14,200	3,500	5,700	100	1,000	100	4,000	(*)
Men	33,000	6,000	13,700	3,400	5,600	100	1,000	100	3,000	(*)
Women	1,600	100	500	100	100	(*)	(*)	(*)	800	(*)
Other physical scientists	7,600	1,800	1,000	300	2,400	(*)	1,000	100	1,000	(*)
Men	7,400	1,700	1,000	300	2,300	(*)	900	100	1,000	(*)
Women	200	100	(*)	(*)	100	(*)	100	(*)	(*)	(*)
Mathematical scientists	44,800	12,500	17,700	1,200	6,300	300	3,800	300	2,600	200
Men	37,900	10,400	15,800	900	5,400	300	2,800	200	2,000	200
Women	6,900	2,100	1,900	300	900	(*)	1,000	100	700	(*)
Mathematicians	32,200	8,800	15,300	700	3,800	200	1,800	100	1,400	100
Men	27,300	7,200	13,700	600	3,400	200	1,300	(*)	700	100
Women	5,000	1,600	1,600	100	400	(*)	500	100	700	(*)
Statisticians	12,600	3,700	2,300	500	2,500	100	2,000	200	1,300	100
Men	10,600	3,200	2,100	300	2,000	100	1,500	200	1,300	100
Women	1,900	400	200	200	500	(*)	500	100	(*)	(*)
Computer specialists	121,800	79,800	6,400	4,200	8,400	1,400	6,800	3,100	10,600	1,000
Men	100,800	66,100	5,100	3,500	6,500	1,300	5,300	2,700	9,700	600
Women	21,100	13,700	1,300	800	2,000	100	1,500	400	1,000	300
Environmental scientists	44,100	18,200	8,200	900	7,900	200	4,000	900	3,700	(*)
Men	42,300	17,700	7,500	900	7,400	200	4,000	900	3,700	(*)
Women	1,800	600	600	100	600	(*)	(*)	(*)	(*)	(*)
Earth scientists	38,200	17,200	6,700	600	6,200	200	3,200	900	3,200	(*)
Men	36,500	16,600	6,200	600	5,700	200	3,100	900	3,200	(*)
Women	1,700	600	600	100	600	(*)	(*)	(*)	(*)	(*)
Oceanographers	1,800	200	700	(*)	200	(*)	500	(*)	100	(*)
Men	1,800	200	700	(*)	200	(*)	500	(*)	100	(*)
Women	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
Atmospheric scientists	4,100	800	800	200	1,500	(*)	400	(*)	400	(*)
Men	4,000	800	700	200	1,400	(*)	400	(*)	400	(*)
Women	100	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
Engineers	998,700	712,800	28,700	19,600	83,900	5,100	67,800	18,800	58,400	3,600
Men	993,500	710,000	28,400	19,300	83,500	5,000	67,100	18,700	57,800	3,500
Women	5,200	2,800	200	200	400	100	700	100	700	(*)
Life scientists	135,900	34,500	47,400	8,200	22,000	400	13,200	900	8,300	800
Men	117,600	31,400	40,300	5,800	20,400	300	11,600	700	6,100	800
Women	18,300	3,000	7,000	2,400	1,900	(*)	1,600	200	2,200	(*)
Biological scientists	68,600	13,500	30,300	4,700	7,300	300	6,500	500	5,100	300
Men	56,000	11,100	25,500	3,400	5,700	300	5,200	400	4,100	300
Women	12,600	2,400	4,800	1,300	1,600	(*)	1,400	100	100	(*)
Agricultural scientists	50,500	18,700	3,800	1,000	14,000	100	5,700	200	1,800	300
Men	50,200	18,600	8,700	900	13,900	100	5,600	200	1,800	300
Women	300	(*)	100	100	(*)	(*)	(*)	(*)	(*)	(*)
Medical scientists	16,800	2,300	8,300	2,600	1,000	(*)	1,000	200	1,300	100
Men	11,300	1,700	6,200	1,500	800	(*)	800	100	200	100
Women	5,500	600	2,100	1,100	200	(*)	200	100	1,200	(*)
Psychologists	61,400	7,400	27,100	14,300	2,200	100	5,200	500	4,300	400
Men	46,400	5,900	20,900	10,400	1,500	100	3,700	400	3,300	200
Women	15,000	1,500	6,200	3,800	700	(*)	1,500	100	1,000	200
Social scientists	99,800	23,800	3,500	9,300	12,000	500	11,800	1,500	4,300	1,600
Men	86,800	21,900	31,700	7,800	9,500	400	9,700	1,400	3,100	1,100
Women	13,200	2,000	3,300	1,500	2,500	(*)	2,100	100	1,200	500
Economists	39,100	13,000	10,800	1,700	6,900	(*)	3,300	1,100	2,100	100
Men	35,800	12,200	10,200	1,600	6,100	(*)	2,900	1,000	1,700	100
Women	3,300	800	700	100	800	(*)	400	(*)	300	100
Sociologists/anthropologists	22,000	4,400	11,900	1,500	1,300	(*)	1,600	100	800	400
Men	17,200	3,600	10,000	1,000	700	(*)	1,000	100	400	400
Women	4,800	800	1,900	400	600	(*)	700	(*)	300	(*)
Other social scientists	38,700	6,400	12,300	6,100	3,800	400	6,800	300	1,500	1,000
Men	33,500	6,100	11,500	5,100	2,700	400	5,900	200	1,000	600
Women	5,100	300	700	1,000	1,100	(*)	900	100	500	400

(*) Too few cases to estimate. Note: Detail may not add to total because of rounding. Source: National Science Foundation.

Table B-7.—Scientists and engineers by field, sex, and work activity: 1974

Field and sex	Total	Research and developmen.				Management or administration			Teach-ing	Consult-ing	Produc-tion/ inspec-tion	Reporting, statis-tical work, com-puting appl.	Other activ-ities	No report
		Total	Basic re-search	Applied re-search	Develop-ment/ design	Total	Of R&D	Other than R&D						
Total, all fields	1,662,200	500,700	57,700	90,900	352,100	400,100	148,500	251,600	123,100	95,600	213,400	174,700	111,900	42,700
Men	1,556,100	477,200	49,800	83,300	344,100	392,400	145,200	247,300	108,800	87,900	206,700	152,600	104,000	36,400
Women	96,000	23,500	7,900	7,500	8,100	7,700	3,300	4,400	14,200	7,700	6,700	22,100	7,900	6,300
Physical scientists	155,600	65,600	21,800	21,600	22,200	33,100	21,200	11,900	19,600	3,900	18,000	5,100	7,500	2,900
Men	141,200	59,200	19,000	19,800	20,400	31,300	20,500	10,900	18,100	3,200	16,100	4,500	6,200	2,600
Women	14,400	6,400	2,800	1,700	1,900	1,800	700	1,000	1,500	600	2,000	600	1,200	300
Chemists	113,300	47,000	13,800	14,900	18,200	24,300	15,500	8,800	11,800	2,400	16,400	2,800	6,600	2,200
Men	100,800	41,200	11,200	13,300	16,600	22,700	14,900	7,900	10,700	2,000	14,600	2,300	5,500	1,900
Women	12,500	5,800	2,600	1,600	1,600	4,500	600	900	1,100	400	1,800	500	1,100	300
Physicists/astronomers	34,600	15,700	6,900	5,300	3,500	6,900	4,500	2,400	7,100	1,000	1,300	1,500	600	600
Men	33,000	15,100	6,700	5,200	3,200	6,600	4,400	2,300	6,700	800	1,100	1,400	500	600
Women	1,600	600	200	100	300	200	100	100	300	200	100	100	100	100
Other physical scientists	7,600	3,000	1,100	1,300	600	2,000	1,200	700	600	500	400	800	300	100
Men	7,400	3,000	1,100	1,300	600	2,000	1,200	700	600	400	300	700	200	100
Women	200	(')	(')	(')	(')	(')	(')	(')	(')	100	(')	(')	100	(')
Mathematical scientists	44,800	6,800	2,500	2,200	2,100	7,500	3,200	4,400	12,600	1,200	2,300	11,400	2,100	800
Men	37,900	5,900	2,200	1,900	1,900	7,000	3,000	4,000	11,200	1,100	2,100	8,200	1,700	700
Women	6,900	900	300	300	300	600	200	300	1,400	100	200	3,200	400	100
Mathematicians	32,200	5,400	2,100	1,600	1,600	5,700	2,300	3,300	11,100	800	1,700	5,900	1,400	300
Men	27,300	4,700	1,800	1,500	1,400	5,100	2,100	3,000	9,800	700	1,400	4,100	1,100	200
Women	5,000	800	300	200	300	500	200	300	1,300	100	200	1,700	300	(')
Statisticians	12,600	1,400	400	500	500	1,900	900	1,000	1,500	400	600	5,500	700	500
Men	10,600	1,300	300	400	500	1,800	900	1,000	1,400	400	600	4,000	500	500
Women	1,900	100	(')	100	(')	(')	(')	(')	100	(')	(')	1,500	200	(')
Computer specialists	121,800	9,700	1,400	2,100	6,100	11,700	4,100	7,600	4,600	5,000	4,300	79,500	3,100	3,900
Men	100,800	8,700	1,200	1,900	5,600	10,900	3,800	7,100	3,800	4,500	3,600	64,900	2,200	2,100
Women	21,100	1,000	200	200	600	800	300	500	900	500	600	14,600	900	1,800
Environmental scientists	44,100	11,800	4,500	5,900	1,500	8,500	3,100	5,400	4,600	3,800	3,100	3,500	6,600	2,000
Men	42,300	11,100	4,000	5,600	1,400	8,500	3,100	5,400	4,500	3,800	3,100	3,500	6,300	1,600
Women	1,800	800	500	300	100	(')	(')	(')	200	(')	(')	100	400	400
Earth scientists	38,200	9,700	3,800	4,600	1,300	7,500	2,500	5,000	4,300	3,600	2,700	2,900	5,700	1,800
Men	36,500	9,000	3,400	4,400	1,200	7,500	2,500	5,000	4,100	3,600	2,700	2,900	5,300	1,500
Women	1,700	700	400	300	100	(')	(')	(')	200	(')	(')	100	400	400
Oceanographers	1,800	900	400	500	100	300	300	(')	100	(')	(')	100	200	100
Men	1,800	900	400	500	100	300	300	(')	100	(')	(')	100	200	100
Women	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')
Atmospheric scientists	4,100	1,200	300	800	100	600	200	400	300	200	400	500	800	100
Men	4,000	1,000	200	800	100	600	200	400	300	200	400	500	800	100
Women	100	100	100	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')	(')

Field and sex	Total	Research and development				Management or administration			Teaching	Consulting	Production/ inspection	Reporting, statistical work, computing appl.	Other activities	No report
		Total	Basic research	Applied research	Development/ design	Total	Of R&D	Other than R&D						
Engineers	998,700	335,000	5,200	32,000	297,700	275,800	93,100	182,700	19,800	54,800	162,500	54,500	73,300	23,200
Men	993,500	333,200	5,200	31,700	296,300	275,500	93,000	182,500	19,700	54,600	161,600	53,200	72,600	23,000
Women	5,200	1,800	100	400	1,400	200	100	200	(')	200	900	1,300	700	100
Life scientists	135,900	41,300	14,700	16,000	10,600	30,800	11,700	19,100	25,900	7,000	10,200	7,900	9,700	3,200
Men	117,600	33,600	11,900	13,400	8,300	28,800	10,900	17,900	21,900	6,200	9,500	7,000	7,900	2,700
Women	18,300	7,600	2,800	2,500	2,300	2,000	800	1,200	4,000	800	700	900	1,800	400
Biological scientists	68,600	24,700	9,400	8,500	6,800	10,800	5,500	5,300	17,100	2,300	3,700	3,800	5,000	1,200
Men	56,000	18,800	7,500	6,400	4,900	9,900	5,100	4,800	14,400	1,900	3,300	3,400	3,300	1,100
Women	12,600	5,800	1,800	2,100	1,900	900	400	500	2,700	400	400	400	1,700	200
Agricultural scientists	50,500	11,400	2,400	6,000	3,000	16,300	4,500	11,900	4,500	3,600	5,800	3,000	4,400	1,400
Men	50,200	11,200	2,300	6,000	3,000	16,300	4,500	11,900	4,500	3,600	5,800	3,000	4,400	1,400
Women	300	200	100	(')	100	(')	(')	(')	(')	(')	(')	(')	(')	(')
Medical scientists	16,800	5,200	2,900	1,500	800	3,600	1,800	1,900	4,300	1,100	700	1,100	300	500
Men	11,300	3,600	2,100	1,100	500	2,500	1,400	1,200	3,000	700	500	600	200	300
Women	5,500	1,600	900	400	400	1,100	400	700	1,300	400	300	500	100	200
Psychologists	61,400	9,100	2,700	3,000	3,400	10,800	4,400	6,300	12,600	14,900	5,700	3,100	3,200	2,000
Men	46,400	6,700	2,100	2,200	2,400	9,100	3,700	5,400	9,800	10,400	4,400	2,600	2,500	1,000
Women	15,000	2,500	600	800	1,000	1,700	800	900	2,800	4,600	1,300	500	700	1,000
Social scientists	99,800	21,300	4,900	8,100	8,300	22,000	7,700	14,300	23,300	5,000	7,300	9,700	6,400	4,700
Men	86,600	18,800	4,300	6,800	7,700	21,400	7,300	14,100	19,900	4,200	6,300	8,800	4,700	2,500
Women	13,200	2,600	600	1,300	600	600	400	200	3,500	800	900	900	1,700	2,200
Economists	39,100	8,800	1,700	3,900	3,100	9,800	3,700	6,000	7,400	1,800	2,500	5,400	2,500	900
Men	35,800	7,800	1,600	3,300	2,900	9,400	3,400	6,000	6,900	1,700	2,400	4,900	1,900	800
Women	3,300	900	200	600	200	300	300	(')	500	100	100	500	600	200
Sociologists/anthropologists	22,000	4,500	1,500	1,400	1,600	3,700	1,400	2,400	8,300	900	1,200	1,500	1,000	900
Men	17,200	3,400	1,200	1,000	1,200	3,400	1,300	2,200	6,300	600	1,100	1,300	500	500
Women	4,800	1,100	300	400	400	300	100	200	1,900	300	100	200	500	400
Other social scientists	38,700	8,100	1,700	2,800	3,600	8,500	2,700	5,900	7,700	2,300	3,600	2,700	2,900	2,900
Men	33,500	7,500	1,500	2,400	3,600	8,500	2,700	5,900	6,700	1,800	2,900	2,600	2,300	1,200
Women	5,100	600	200	400	(')	(')	(')	(')	1,000	500	700	100	700	1,700

(') Too few cases to estimate.
Note: Detail may not add to total because of rounding.
Source: National Science Foundation

Table B-8.—Scientists and engineers by field, sex, and race: 1974

Field and sex	Total	White	Black	American Indian	Asian	Other
Total, all fields	1,973,200	1,886,200	31,700	1,700	36,500	17,000
Male	1,788,000	1,717,100	23,200	1,200	32,200	14,200
Female	185,200	169,100	8,500	600	4,300	2,700
Physical scientists	188,300	178,600	3,500	300	4,600	1,300
Male	169,900	162,100	2,900	300	3,800	700
Female	18,400	16,500	600	(')	800	600
Chemists	138,000	130,800	3,000	300	3,100	900
Male	122,400	117,000	2,400	300	2,400	300
Female	15,600	13,800	500	(')	700	600
Physicists/astronomers	42,400	40,300	300	(')	1,400	400
Male	39,900	37,800	300	(')	1,400	400
Female	2,500	2,400	100	(')	(')	(')
Other physical scientists	7,800	7,500	300	(')	100	(')
Male	7,500	7,200	300	(')	100	(')
Female	300	300	(')	(')	(')	(')
Mathematical scientists	60,400	56,800	1,900	(')	1,300	300
Male	45,200	42,600	1,300	(')	1,000	300
Female	15,200	14,100	600	(')	300	100
Mathematicians	43,500	40,900	1,300	(')	900	200
Male	32,500	30,700	900	(')	700	200
Female	10,900	10,200	400	(')	200	100
Statisticians	16,900	15,900	500	(')	400	100
Male	12,600	11,900	400	(')	200	100
Female	4,200	3,900	200	(')	100	(')
Computer specialists	125,500	119,800	2,500	100	2,400	700
Male	101,300	97,000	1,600	100	2,000	600
Female	24,200	22,900	900	(')	400	100
Environmental scientists	52,000	51,000	100	100	500	400
Male	49,300	48,500	100	100	300	400
Female	2,700	2,500	(')	(')	200	(')
Earth scientists	45,600	44,700	100	100	400	300
Male	43,000	42,300	(')	100	200	300
Female	2,600	2,400	(')	(')	200	(')
Oceanographers	2,000	2,000	(')	(')	(')	(')
Male	2,000	2,000	(')	(')	(')	(')
Female	(')	(')	(')	(')	(')	(')
Atmospheric scientists	4,300	4,300	(')	(')	(')	(')
Male	4,200	4,200	(')	(')	(')	(')
Female	100	100	(')	(')	(')	(')
Engineers	1,071,800	1,034,500	8,500	500	20,200	8,100
Male	1,064,100	1,027,300	8,400	500	20,000	7,900
Female	7,600	7,200	100	(')	200	100
Life scientists	193,900	184,200	3,500	100	2,700	3,300
Male	159,800	152,700	2,200	100	2,100	2,700
Female	34,100	31,500	1,300	(')	600	600
Biological scientists	118,000	110,700	2,800	100	2,100	2,200
Male	91,300	86,300	1,600	100	1,600	1,700
Female	26,600	24,400	1,200	(')	500	500
Agricultural scientists	57,900	56,100	400	(')	300	900
Male	56,200	54,500	400	(')	300	900
Female	1,600	1,600	(')	(')	(')	(')
Medical scientists	18,100	17,400	200	(')	300	200
Male	12,200	11,900	100	(')	200	100
Female	5,900	5,500	200	(')	100	100
Psychologists	94,700	89,700	1,600	100	2,600	800
Male	67,700	65,100	800	(')	1,300	500
Female	27,100	24,600	800	100	1,300	300
Social scientists	186,700	171,700	10,200	500	2,200	2,100
Male	130,800	121,900	6,000	100	1,800	1,100
Female	55,900	49,800	4,200	400	500	1,000
Economists	54,600	51,900	1,400	100	800	500
Male	49,600	47,800	600	100	700	400
Female	5,000	4,100	800	(')	(')	(')
Sociologists/anthropologists	50,400	45,400	3,900	(')	200	900
Male	26,800	24,500	2,000	(')	200	100
Female	23,600	20,900	1,900	(')	(')	800
Other social scientists	81,700	74,400	4,800	500	1,200	700
Male	54,400	49,600	3,400	(')	800	600
Female	27,300	24,800	1,500	400	400	200

' Too few cases to estimate.
Note: Detail may not add to total because of rounding.
Source: National Science Foundation

Table B-9.—Geographic distribution of scientists and engineers: 1974

State	Total	Scientists	Engineers
United States, total	1,973,200	901,000	1,071,800
Alabama	23,200	7,100	16,000
Alaska	3,300	1,700	1,600
Arizona	18,100	8,000	10,100
Arkansas	7,900	4,500	3,300
California	243,000	94,900	148,000
Colorado	31,200	13,700	17,500
Connecticut	43,200	17,300	26,000
Delaware	18,900	13,300	5,500
Florida	43,500	18,500	25,000
Georgia	31,700	16,600	15,200
Hawaii	7,200	3,400	3,800
Idaho	7,000	4,300	2,700
Illinois	107,200	52,500	54,700
Indiana	36,100	14,700	21,400
Iowa	19,200	10,700	8,500
Kansas	13,800	6,500	7,300
Kentucky	16,700	9,400	7,300
Louisiana	25,600	10,000	15,600
Maine	4,400	2,200	2,200
Maryland	54,300	29,200	25,200
Massachusetts	85,600	38,500	47,000
Michigan	92,500	41,800	50,600
Minnesota	38,600	17,300	21,400
Mississippi	9,800	4,400	5,400
Missouri	42,900	21,900	21,000
Montana	4,600	2,700	1,900
Nebraska	8,900	4,700	4,300
Nevada	2,700	1,500	1,200
New Hampshire	8,200	4,300	4,000
New Jersey	91,200	41,800	49,400
New Mexico	12,800	6,100	6,700
New York	188,900	97,200	91,700
North Carolina	29,300	15,900	13,400
North Dakota	5,600	3,400	2,200
Ohio	106,900	42,100	64,800
Oklahoma	19,900	9,100	10,800
Oregon	17,300	10,100	7,200
Pennsylvania	109,200	42,700	66,500
Rhode Island	8,000	4,100	4,000
South Carolina	17,800	8,200	9,600
South Dakota	2,900	1,700	1,300
Tennessee	30,000	12,600	17,400
Texas	102,300	42,700	59,500
Utah	10,000	3,800	6,200
Vermont	3,900	1,600	2,300
Virginia	47,100	23,200	23,800
Washington	40,600	14,500	26,200
West Virginia	12,700	6,400	6,300
Wisconsin	31,200	16,100	15,200
Wyoming	4,400	2,800	1,600
District of Columbia	31,800	19,800	12,000

Note: Detail may not add to total because of rounding.
Source: National Science Foundation

APPENDIX C

Reproduction of Covering Letters, Questionnaires, and Reference Lists

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CERTIFIED MAIL

O.M.B. No. 41-S73084; Approval Expires December 31, 1974

FORM PMS-14C (10-23-73)

U.S. DEPARTMENT OF COMMERCE
SOCIAL AND ECONOMIC STATISTICS ADMIN.
BUREAU OF THE CENSUS

1974 NATIONAL SURVEY OF SCIENTISTS AND ENGINEERS

NOTICE – Your report to the Census Bureau is confidential by law (Title 13, U.S. Code). It may be seen only by sworn Census employees and may be used only for statistical purposes.

Please read instructions carefully before answering questions.

Answer as accurately as you can by printing your reply clearly or by entering an "X" in the box next to the appropriate reply.

If the instructions for a question direct you to enter a code and description from a list, please refer to the reference list attached to this questionnaire.

A. Is the information shown in the mailing label above correct?

☐ YES

☐ NO – *Please enter the correct information*

Name

Number and street

City or town | State (if USA) (010) | ZIP code

Foreign country

B. Is this mailing address the same address as your place of residence?

☐ SAME

☐ DIFFERENT – *Please enter your city and State or foreign country of residence.*

City or town | State (if USA) (011) | ZIP code

Foreign country

Dear Friend:

A few weeks ago, you were asked to participate in a voluntary survey of persons in scientific, engineering, and related occupations. Since we have not yet received your questionnaire we have sent this additional copy. Sometimes people hesitate to return a questionnaire because they underestimate the value of their answers. We want to stress that your answers in this survey are especially important because we are asking these questions of only a carefully selected sample of persons and, if the results are to be truly representative, the return of each questionnaire is needed.

In correspondence from others who have been asked to complete the questionnaire, there are several questions which have been asked repeatedly. Since some of these same questions may also be on your mind, we should like to give you our answers.

What about confidentiality? By law (Title 13, United States Code), your reply may be seen only by sworn Census employees. It may not be given to any other government agency or to anyone else. Furthermore, all Census workers are subject to severe penalty if they violate their oath not to reveal any of this information. The findings of the survey may be presented only in a form which cannot be traced to a particular person.

What is the purpose of the survey? The primary purpose of this survey is to obtain current information on education and employment of persons trained in professional, scientific, technical, or related fields. There is no other source of this particular information for the specific occupations involved. Such information is asked from a sample of such persons and the resultant statistics are used in the planning and implementation of various Government and private programs designed to promote effective development and utilization of highly trained persons.

What about persons who are retired or working in nontechnical jobs? The sample includes persons who have completed certain levels of education as well as those who have worked in designated professional and technical jobs. Even if you are not now working or are working in a non-scientific or nontechnical job, your reply will be most useful to us in describing career patterns.

What about particular questions for which answers are not available? If you cannot recall some of the specific details asked for on the questionnaire, approximations are acceptable for statistical purposes. Please answer all the questions to the best of your ability and return the questionnaire even if some items must be left blank.

What about persons no longer residing in the United States? Even though you may be living outside the United States at present, please return your questionnaire, as information is also needed on highly qualified persons who leave the country.

Please take the time to complete this questionnaire and return in the enclosed preaddressed envelope. We greatly appreciate your cooperation.

Sincerely,

Meyer Zitter

MEYER ZITTER
Chief, Population Division
Bureau of the Census

Enclosure

PART I – EDUCATION AND TRAINING

1. EDUCATIONAL ATTAINMENT

How many years of education or formal training BEYOND HIGH SCHOOL have you COMPLETED? (Include college, junior college, graduate school, law school, business college, technical institute, etc., but **do not include** work taken through correspondence courses, on-the-job training, apprenticeship, or at employer's training facility. For any education received in foreign or ungraded schools, mark the equivalent number of years in the regular American school system.)

(012)
- 0 years
- 1 year
- 2 years
- 3 years
- 4 years
- 5 years
- 6 years
- 7 years
- 8 years or more

2. EDUCATION SINCE 1971

a. Since 1971, have you attended any college, university, or other post-high school institution?

(013)
- 1 Yes – *Continue with 2b*
- 2 No – *SKIP to question 3*

b. List below each institution from which you have obtained or are currently obtaining formal training beyond the high school level and give the other information requested. Begin with the most recent and work back through 1972. Use a separate column for each degree granted or worked for. Designate degrees by abbreviation (e.g., A.A., B.A., M.A., Ph.D., LL.B., M.D., etc.). **Do not include** work taken through correspondence courses, on-the-job training, apprenticeship, or at employer's training facility.

	MOST RECENT	SECOND-TO-LAST	THIRD-TO-LAST
	(014)	(015)	(016)
(1) College, university, etc. *(Enter name, city, and State or foreign country)*	Name City State or foreign country	Name City State or foreign country	Name City State or foreign country
(2) Year attendance ended	(017) 2 1972; 3 1973; 4 1974; 5 Now enrolled	(018) 2 1972; 3 1973; 4 1974	(019) 2 1972; 3 1973
(3) Type of degree worked for, if any *(Enter A.A., B.S.E.E., B.A., etc., or mark "None" box)*	(020) x None	(021) x None	(022) x None
(4) Year degree awarded or to be awarded *(Enter year or mark "None" box)*	(023) 19 x None	(024) 19 x None	(025) 19 x None
(5) Major field of study *(Enter code and description from Reference List A.)*	(026) Code; Description	(027) Code; Description	(028) Code; Description

3. OTHER TRAINING SINCE 1971

Aside from formal education, which of the following types of training did you receive in 1972 or 1973?

(Mark the appropriate year for each type of training you have received.)

	(029) 1972	(030) 1973
1. On-the-job training	1	1
2. Military training applicable to civilian occupations	2	2
3. Extension or correspondence courses	3	3
4. Courses at employers training facility	4	4
5. Courses at adult education center	5	5
6. Other training	6	6
7. None	7	7

PART II – WORK STATUS

(Complete questions 4 through 9 for column (A) and then for column (B))

	Work status during the last full week in January 1974 (January 20–26) (A)	Work status during the last full week in January 1973 (January 21–27) (B)
4. Were you working during that week?	(031) 1 Yes, working full time – *SKIP to 6*; 2 Yes, working part time – *Continue with 5*; 3 No, not working – *SKIP to 8*	(032) 1 Yes, working full time – *SKIP to 6*; 2 Yes, working part time – *Continue with 5*; 3 No, not working – *SKIP to 8*
5. If you worked part time, were you seeking full-time employment?	(033) 1 Yes, seeking full-time work; 2 No, preferred part-time work; 3 No, full-time work not available	(034) 1 Yes, seeking full-time work; 2 No, preferred part-time work; 3 No, full-time work not available
6. Were you working in a position related to science or engineering?	(035) 1 Yes – *SKIP to 9*; 2 No – *Continue with 7*	(036) 1 Yes – *SKIP to 9*; 2 No – *Continue with 7*
7. If you were working in a position NOT related to science or engineering, what was the MOST important reason for taking this position?	(037) *(MARK ONLY ONE BOX)* 1 Preferred nonscience or nonengineering position; 2 Promoted out of science or engineering position; 3 Pay was better in nonscience or nonengineering position; 4 Locational preference; 5 Science or engineering position not available; 6 Other – *Specify*	(038) *(MARK ONLY ONE BOX)* 1 Preferred nonscience or nonengineering position; 2 Promoted out of science or engineering position; 3 Pay was better in nonscience or nonengineering position; 4 Locational preference; 5 Science or engineering position not available; 6 Other – *Specify*
8. If you were not working, were you principally —	(039) *(MARK ONLY ONE BOX)* 1 On vacation or otherwise temporarily absent from a job for health or personal reasons; 2 On temporary layoff from a job; 3 Looking for work; 4 Retired; 5 Student; 6 Tending to family responsibilities; 7 Other – *Specify*	(040) *(MARK ONLY ONE BOX)* 1 On vacation or otherwise temporarily absent from a job for health or personal reasons; 2 On temporary layoff from a job; 3 Looking for work; 4 Retired; 5 Student; 6 Tending to family responsibilities; 7 Other – *Specify*
9. Were you on a post doctoral appointment?	(041) 1 Yes; 2 No	(042) 1 Yes; 2 No

PART III – JOB ACTIVITIES

INSTRUCTIONS FOR COMPLETING QUESTIONS 10–18

a. Complete column (A) for questions 10 through 18 for the job held during the last full week of January 1974 or for your most recent prior job held.

b. Column (B) should be completed if the job you had during the last full week of January 1973 differed from the job described in column (A). If the job was the same, mark (X) the "Same job as column (A)" box at the top of column (B). **NOTE:** Consider a change in jobs to have occurred if there were significant changes in duties, level of responsibility, or occupation even if you continued to work for the same employer.

c. If you held more than one job during the weeks mentioned above, please report **only** the job at which you worked the greatest number of hours.

	Job held during week of January 20–26, 1974 or most recent prior job (A)	Job held during week of January 21–27, 1973 (B)	SAME JOB AS COLUMN (A) (043) ☐
10. Where did you work? *Location (city and State or foreign country) of company, business, agency, or other employer.*	(044) ☐☐☐ City _____ (046) ☐☐☐ State or foreign country _____	(045) ☐☐☐ City _____ (047) ☐☐☐ State or foreign country _____	
11. What kind of business was this? *Enter code and description from Reference List B. If the organization conducted activities at different locations (e.g., research at one location and manufacturing at another), enter the activity at the location where you worked.*	(048) Code ☐☐☐ Description _____	(049) Code ☐☐☐ Description _____	
12. What was your occupation? *Enter code and description from Reference List C.*	(050) Code ☐☐☐ Description _____	(051) Code ☐☐☐ Description _____	
13. What work activities were related to this position? *Mark all activities in which you spent time.*	01 ☐ Management or administration of research and development 02 ☐ Management or administration of other than research and development 03 ☐ Teaching and training – preparing and teaching courses, guiding and counseling students or trainees 04 ☐ Basic research 05 ☐ Applied research 06 ☐ Development – product, process, and technical development 07 ☐ Report and technical writing, editing, information retrieval 08 ☐ Clinical diagnosis – diagnosis, treatment, etc. for patients or clients 09 ☐ Design – of equipment, processes, models, drafting, drawing, blueprints 10 ☐ Quality control, testing, evaluation, or inspection of equipment, materials, devices 11 ☐ Operations – production, maintenance, construction, installation 12 ☐ Distribution – sales, traffic, purchasing, customer and public relations 13 ☐ Statistical work – designing and conducting sample and other surveys, forecasting, statistical analysis 14 ☐ Consulting – on technical aspects of professional, scientific, and management fields or products 15 ☐ Computer applications – programming, data systems analysis, development of programming techniques, controlling computer operations 16 ☐ Other activities – *Specify*	01 ☐ Management or administration of research and development 02 ☐ Management or administration of other than research and development 03 ☐ Teaching and training – preparing and teaching courses, guiding and counseling students or trainees 04 ☐ Basic research 05 ☐ Applied research 06 ☐ Development – product, process, and technical development 07 ☐ Report and technical writing, editing, information retrieval 08 ☐ Clinical diagnosis – diagnosis, treatment, etc. for patients or clients 09 ☐ Design – of equipment, processes, models, drafting, drawing, blueprints 10 ☐ Quality control, testing, evaluation, or inspection of equipment, materials, devices 11 ☐ Operations – production, maintenance, construction, installation 12 ☐ Distribution – sales, traffic, purchasing, customer and public relations 13 ☐ Statistical work – designing and conducting sample and other surveys, forecasting, statistical analysis 14 ☐ Consulting – on technical aspects of professional, scientific, and management fields or products 15 ☐ Computer applications – programming, data systems analysis, development of programming techniques, controlling computer operations 16 ☐ Other activities – *Specify*	
14. Among all the activities marked above (in question 13) which in terms of working hours spent was your primary and which was your major secondary activity? *Fill in the appropriate code numbers from the activities in question 13.*	CODE (052) _____ Primary (054) _____ Secondary	CODE (053) _____ Primary (055) _____ Secondary	
15. Were you primarily —	*(MARK ONLY ONE BOX)* (056) 1 ☐ Employee of private company, business, or individual for wages, salary, or commissions 2 ☐ Employee of nonprofit organization (excluding government) 3 ☐ Federal government employee 4 ☐ State government employee 5 ☐ Local government employee (city, county, etc.) 6 ☐ Employee of international organization Self-employed in own business, profession, or farm 7 ☐ Own business – not incorporated 8 ☐ Own business – incorporated 9 ☐ Working without pay in family business or farm	*(MARK ONLY ONE BOX)* (057) 1 ☐ Employee of private company, business, or individual for wages, salary, or commissions 2 ☐ Employee of nonprofit organization (excluding government) 3 ☐ Federal government employee 4 ☐ State government employee 5 ☐ Local government employee (city, county, etc.) 6 ☐ Employee of international organization Self-employed in own business, profession, or farm 7 ☐ Own business – not incorporated 8 ☐ Own business – incorporated 9 ☐ Working without pay in family business or farm	

PART III – JOB ACTIVITIES – Continued

	Job held during week of January 20–26, 1974, or most recent prior job (A)	Job held during week of January 21–27, 1973 (B)	SAME JOB AS COLUMN (A) ☐
16. Between what dates did you hold this position? *Enter month and year*	From (058) To (059)	From (060) To (061)	
17. What was the basic salary associated with this position? If you were on a post-doctoral appointment, include stipend plus allowances. Indicate whether the figure entered is per year, per month, or per week. (Basic salary refers to salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for secondary jobs.)	(062) $ _____ .00 (064) 1 ☐ Per year 2 ☐ Per month 3 ☐ Per week **If academically employed, mark whether salary is for –** (066) 1 ☐ 9–10 months 2 ☐ 11–12 months	(063) $ _____ .00 (065) 1 ☐ Per year 2 ☐ Per month 3 ☐ Per week **If academically employed, mark whether salary is for –** (067) 1 ☐ 9–10 months 2 ☐ 11–12 months
18a. Was ANY of your work supported or sponsored by U.S. Government funds?	(068) 1 ☐ Yes – *Continue with 18b* 2 ☐ No – *SKIP to 19a* 3 ☐ Don't know – *SKIP to 19a*	(069) 1 ☐ Yes – *Continue with 18b* 2 ☐ No – *SKIP to 19a* 3 ☐ Don't know – *SKIP to 19a*
b. Which of the following agencies or departments were supporting the work?	(070) 1 ☐ Department of Housing and Urban Development 2 ☐ Department of the Interior 3 ☐ Department of Labor 4 ☐ Department of Defense 5 ☐ Department of Commerce 6 ☐ Department of Agriculture (072) 7 ☐ Department of Transportation 8 ☐ Department of Justice Department of Health, Education and Welfare 9 ☐ NIH (National Institutes of Health) 10 ☐ Health Services and Mental Health Administration (074) 11 ☐ Office of Education 12 ☐ Other H.E.W. – *Specify* ▶ 13 ☐ NASA (National Aeronautic and Space Administration) (076) 14 ☐ NSF (National Science Foundation) 15 ☐ EPA (Environmental Protection Agency) 16 ☐ AEC (Atomic Energy Commission) (078) 17 ☐ AID (Agency for International Development) 18 ☐ Other agency or department – *Specify* ▶ 19 ☐ Don't know source agency	(071) 1 ☐ Department of Housing and Urban Development 2 ☐ Department of the Interior 3 ☐ Department of Labor 4 ☐ Department of Defense 5 ☐ Department of Commerce 6 ☐ Department of Agriculture (073) 7 ☐ Department of Transportation 8 ☐ Department of Justice Department of Health, Education and Welfare 9 ☐ NIH (National Institutes of Health) 10 ☐ Health Services and Mental Health Administration (075) 11 ☐ Office of Education 12 ☐ Other H.E.W. – *Specify* ▶ 13 ☐ NASA (National Aeronautic and Space Administration) (077) 14 ☐ NSF (National Science Foundation) 15 ☐ EPA (Environmental Protection Agency) 16 ☐ AEC (Atomic Energy Commission) (079) 17 ☐ AID (Agency for International Development) 18 ☐ Other agency or department – *Specify* ▶ 19 ☐ Don't know source agency

PART IV – OTHER INFORMATION

19a. At anytime during calendar year 1973, were you without a job AND actively seeking employment?	(080) 1 ☐ Yes – *Continue with 19b* 2 ☐ No – *SKIP to question 20*
b. For how many weeks were you seeking employment?	(081) ☐ 1 week ☐ 2 weeks ☐ 3 weeks ☐ 4 weeks or more
20. Based on my total education and experience, I now regard myself professionally as a (an) — *Enter code and description from Reference List C*	(082) Code ☐☐☐ Description _____
21. Listed at the right, are selected topics of critical national interest. If you devote a significant proportion of your professional time to any of these problem areas, please mark the box for the one on which you spend the MOST time. *Mark only one box*	(083) 01 ☐ Health Education: 02 ☐ Teaching 03 ☐ Other 04 ☐ Environment protection, pollution control 05 ☐ Space 06 ☐ Crime prevention and control 07 ☐ Food production and technology 08 ☐ Energy and fuel 09 ☐ Other mineral resources 10 ☐ Community development and services 11 ☐ Housing (planning, design, construction) 12 ☐ Does not apply
22. In the event that it is necessary to contact you to clarify some of the information you provide, may we contact you by telephone? *If "Yes," please enter the telephone number(s) on which you can be reached.*	☐ Yes ▶ Area code ___ Telephone number ___ ☐ No
23. Please enter the name of a person at an address other than yours through whom you can be reached	Name Address (Number and street) City / State or foreign country / ZIP code
Print your name here	Date prepared

REFERENCE LIST A – MAJOR FIELDS OF STUDY

This list is to be used in answering question 2b about the field(s) in which you have obtained study or training. It is divided into two sections: Section I is a list of fields of academic study generally leading to bachelor's or higher degrees; Section II is a list of fields of study and training below that generally leading to a bachelor's degree.

Please scan the entire list, choose the appropriate answer for the question and then enter the code and description in the appropriate section of question 2b. If none of the categories listed below adequately describes what you were studying or being trained in, use the "Other" category (code 600 or 625) and enter a brief description of what you were studying in the space provided on the questionnaire.

Section I – FIELDS OF ACADEMIC STUDY LEADING TO BACHELOR'S OR HIGHER DEGREES

Code	Description
	Biological and Agricultural Sciences and Related Fields
501	Agriculture, business
502	Agriculture, general
503	Agronomy, field crops
504	Anatomy and histology
505	Animal physiology
506	Animal science
507	Bacteriology, virology, mycology, parasitology
508	Biochemistry
509	Biology, general
510	Biophysics
511	Botany, general
512	Dairy science (dairy husbandry)
513	Entomology
514	Farm management
515	Fish and game or wildlife management
516	Food science (food technology and processing, dairy manufacturing and technology, food industry)
517	Forestry
518	Genetics
519	Horticulture
520	Immunology
521	Microbiology
522	Plant pathology
523	Plant physiology
524	Soil science (soil management, soil conservation)
525	Zoology, general
526	Biological and agricultural sciences, other fields
	Education
527	Biological sciences education
528	Mathematics education
529	Physical sciences education
530	Trade and industrial training
531	Education, other fields
	Engineering
532	Aerospace, aeronautical, astronautical, and related fields
533	Agricultural
534	Architectural
535	Chemical, petroleum refining
536	Civil, construction, transportation
537	Electrical, electronics
538	Engineering sciences, mechanics, physics
539	Engineering, technology
540	Environmental, Sanitary engineering
541	General or unified
542	Industrial
543	Mechanical
544	Metallurgical, materials, ceramics
545	Mining, mineral
546	Naval architecture and marine engineering
547	Nuclear
548	Operations Research, Systems Engineering
549	Petroleum
550	Engineering, other fields
	Health Fields
551	Medicine or premedicine, and clinical medical sciences
552	Nursing (4 year or longer program)
553	Pathology
554	Pharmacology
555	Pharmacy
556	Health professions, other fields (4 year or longer program)
	Mathematical Sciences
557	Mathematics
558	Statistics and actuarial sciences
559	Computer sciences and systems analysis
	Physical Sciences
560	Astronomy
561	Chemistry
593	Geography
563	Meteorology
564	Physics
565	Physical sciences, general
566	Geology and geophysics
567	Oceanography
568	Physical sciences, other fields
	Psychology
569	Clinical
570	Educational
571	General psychology
572	Psychology, other fields
	Social Sciences
573	Anthropology
574	Area studies, regional studies
575	Economics, agricultural
576	Economics, except agricultural
577	Foreign service programs
593	Geography
579	History
580	Industrial relations
581	International relations
582	Political science or government
583	Public administration
584	Social sciences, general
585	Social work, social administration, social welfare
586	Sociology
587	Social sciences, other fields
	Arts, Humanities, and Other Specialties
588	Arts, general
589	Business and commerce, including accounting, hotel and restaurant administration, and secretarial studies
590	English and journalism
591	Fine and applied arts, all fields
592	Foreign language and literature, all fields
593	Geography
594	Home economics, all fields
595	Law or prelaw
596	Library science
597	Military science, including merchant marine deck officer
598	Philosophy, all fields
599	Religion and theology, all fields
600	Other *(Describe briefly under the applicable item on the questionnaire.)*

Section II – FIELDS OF ACADEMIC STUDY AND OCCUPATIONAL TRAINING RELATED TO PROGRAMS BELOW THE BACCALAUREATE

Code	Description
	Data Processing-related fields of study or training
601	Computer programming
602	Computer operating
603	All other data processing fields of study or training
	Engineering-related fields of study or training
604	Drafting and design, all fields
605	Aeronautical technology
606	Architectural or building technology
607	Chemical technology
608	Civil technology
609	Electrical and electronics technology
610	Industrial technology
611	Mechanical technology
612	All other engineering-related fields of study or training
	Science-related fields of study or training
613	Agriculture
614	Forestry
615	Other science-related fields of study or training
	Other fields of study or training
616	Business and commerce-related fields of study or training
617	Craft (skilled) occupations-related fields of study or training (such as carpentry, bricklaying, tool and die making, etc.)
618	Educational-related fields of study or training
619	Home economics
620	Nursing and other health service-related fields of study or training
621	Operative occupations-related fields of study or training (such as machine operation, driving, inspecting, etc.)
622	Police technology or law enforcement
623	Sales and marketing-related fields of study or training
624	Service occupations-related fields of study or training (such as cook, beautician, firefighter, etc.)
625	All other fields of study or training *(Describe briefly under the applicable item on the questionnaire.)*

REFERENCE LIST B – KINDS OF BUSINESSES

This list is to be used in answering question 11 about the kind(s) of business or industry for which you worked. Please scan the entire list, choose the appropriate answer for the question and enter the code and description from this list. If none of the categories listed below adequately describes the kind of business for which you worked, use the "Other" category (code 731).

Code	Description
	Manufacturing
701	Aircraft, aircraft engines, parts
702	Chemicals and allied products
703	Electrical machinery, equipment and supplies for the generation, storage, transformation, transmission, and utilization of electrical energy
704	Electronic apparatus, radio, television and communication equipment and parts
705	Electronic computers, accounting, calculating and office machinery and equipment
706	Fabricated metal products (except ordnance, machinery and transportation equipment)
707	Machinery (except electrical) including engines and turbines, farming and construction machinery, mining, metalworking and other manufacturing and service industry machines
708	Motor vehicles and motor vehicle equipment including trucks, buses, automobiles, railroad engines and cars
709	Ordnance, including manufacture of arms, ammunition, tanks, and complete guided missiles, space vehicles and equipment
710	Petroleum refining and related industries
711	Primary metal industries, including smelting, refining, rolling, drawing, alloying, and manufacture of castings, forgings and other basic metal products
712	Professional and scientific equipment and supplies
713	Other manufacturing including printing and publishing
	Educational Institutions
714	College or university (offering at least a BA degree)
715	Junior college or technical institute
716	Medical school
717	Other educational institutions
	Health Services
718	Hospital or clinic
719	Other medical and health services
	Other Kinds of Business
720	Agriculture, forestry, and fisheries
721	Business, personal, and repair services
722	Construction
723	Engineering or architectural services
724	Finance, insurance, or real estate
725	Mining and petroleum extraction
726	Private, nonprofit organizations other than educational institutions and hospitals
727	Professional and technical societies
728	Research institutions
729	Retail and wholesale trade
730	Transportation, communication, or other public utilities
731	Other *(Describe briefly under the applicable item on the questionnaire.)*
	Public Administration (include only uniquely governmental activities, such as the U.S. Postal Service, U.S. Air Force, State court, Department of Motor Vehicles, city building inspection, or city public welfare. For example, if you work for the U.S. Postal Service use code 733, Federal public administration; on the other hand, if you work at a Veterans' Administration Hospital, use code 718, Hospital or clinic; if you work at a State university, use code 714, College or university; if you work for a county road building agency, use code 722, Construction; if you work in a Defense Department research laboratory, use code 728, Research institution.)
732	Uniformed military service
733	Federal public administration
734	State public administration
735	Local public administration (city, county, etc.)
736	Other government

REFERENCE LIST C – OCCUPATIONS

This list is to be used in answering questions 12 and 20 about your occupational classification. Please scan the entire list, choose the appropriate entry and enter the code and description from this list. If you cannot find exactly the right entry, please choose the one that comes nearest to it. If none of the entries is at all appropriate, use the "Other" category (code 475) and enter a brief description in the space provided on the questionnaire.

Code	Description
	Engineers, including college professors and instructors
401	Engineer, aeronautical and astronautical
402	Engineer, agricultural
403	Engineer, chemical
404	Engineer, civil and architectural
405	Engineer, electrical and electronic
406	Engineer, industrial
407	Engineer, mechanical
408	Engineer, metallurgical and materials
409	Engineer, mining and petroleum
410	Engineer, nuclear
411	Engineer, environmental and sanitary
412	Engineer, operations research systems
413	Engineer, other fields *(Describe briefly under the applicable item on the questionnaire.)*
	Computer Specialist, including college professors and instructors
414	Computer programmer
415	Computer systems analyst
416	Computer scientist
417	Other computer specialist *(Describe briefly under the applicable item on the questionnaire.)*
	Mathematicians and Statisticians, including college professors and instructors
418	Actuary
419	Mathematician
420	Statistician
421	Operations research analyst
	Physical Scientists, including college professors and instructors
422	Chemist
423	Earth scientists including geologists, geophysicists, etc.
424	Physicist, astronomer
425	Atmospheric scientist, meteorologist
426	Oceanographer
427	Other physical scientist *(Describe)*
	Biological Scientists, including college professors and instructors
428	Agricultural scientists, including foresters and conservationists
429	Biological scientist
430	Biochemist
431	Biophysicist
432	Medical scientist, excluding persons who are primarily medical practioners: see Health Occupations
433	Other biological scientist *(Describe)*
	Social scientists, including college professors and instructors
434	Economist
435	Psychologist
436	Sociologist or anthropologist
437	Other social scientist *(Describe briefly under the applicable item on the questionnaire.)*
	Health Occupations, including persons who are primarily practitioners. Persons engaged primarily in medical research, teaching, and similar activities use code 432, Medical scientist.
438	Physician or surgeon
439	Technician, dental
440	Technician, medical
441	Other health occupation *(Describe briefly under the applicable item on the questionnaire.)*
	Technicians and Technologists, except medical
442	Designer, electronic parts and machine tools
443	Designer, industrial
444	Designer, other
445	Draftsman
446	Surveyor
447	Technician, biological and agricultural
448	Technician, electrical and electronic
449	Technician, construction, highways, and architectural
450	Technician, mechanical
451	Technician, other engineering
452	Technician, physical science
453	Technician, other fields *(Describe briefly under the applicable item on the questionnaire.)*
	Teachers
454	Teacher, elementary school
455	Teacher, secondary school
456	Teacher, college and university, excluding engineering and science *(Engineering and science teachers see codes 401–437 above.)*
	Administrators, Managers, and Officials, excluding farm
457	College president or dean
458	Administrator or manager, scientific and technical research and development
459	Administrator or manager, production and operations
460	Administrator, manager, or official, all other, excluding self-employed
461	Self-employed proprietor
	All Other Occupations
462	Accountant
463	Attorney or judge
464	Sales worker
465	Clerical worker (such as bookkeeper, secretary, etc.)
466	Clergy
467	Craft worker (such as baker, carpenter, electrician, mechanic, repair worker)
468	Farmer (owner, manager, tenant, or farm laborer)
469	Fire fighter or police
470	Laborer, except farm
471	Librarian
472	Merchant or shopkeeper, self-employed
473	Operative (such as assembler, factory worker, miner, welder, truck driver, etc.)
474	Postal worker
475	Other occupations, not specified above *(Describe briefly under the applicable item on the questionnaire.)*

UNIVERSITY OF CALIFORNIA, LOS ANGELES

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO — SANTA BARBARA • SANTA CRUZ

LABORATORY FOR RESEARCH ON HIGHER EDUCATION

July 1, 1974

Dear Member of our Survey Panel:

The Laboratory for Research on Higher Education and the American Council on Education, with the support of the National Science Foundation, are conducting a survey of college students and former college students. The results of this survey will be used to examine educational and career patterns of young people after they enter college.

You have been selected to receive this questionnaire because you completed a brief information form when you first entered college in 1969; on this form you indicated, among other things, your academic interests and educational and career plans. Now, five years later, we are sending a follow-up form to a limited sample, and maximum response is needed in order for the results to be valid. We would appreciate it if you would complete this questionnaire and return it as soon as possible in the enclosed postage-paid envelope. Your participation in this study is of special value because it will permit an assessment of changes over time. We are interested in your responses even if you attended college for a short time only.

The information you provide will be coded so that you will remain anonymous; it will be used in group comparisons for research purposes only. Your individual responses will be kept entirely confidential and will not be reported under any circumstances. Your name appears on the questionnaire in order to assure that you are the same person who filled out the original freshman information form.

BE SURE TO KEEP THIS LETTER WITH THE QUESTIONNAIRE. Codes for your major field of study and your current occupation are printed on the reverse side and will be necessary for answering two important items.

Thank you very much for your cooperation.

Sincerely yours,

Allan M. Cartter

Allan M. Cartter
Director

OCCUPATIONS

Use this list for Question 3. Find the number corresponding to the appropriate occupation and mark it in the box and corresponding grid spaces provided on the questionnaire.

BIOLOGICAL SCIENCES
01 Agricultural scientist
02 Biochemist
03 Biophysicist
04 Physiologist
05 Biological scientist, other

ENGINEERING
06 Aerospace, aeronautical, etc
07 Chemical
08 Civil, construction, transportation
09 Electrical, electronics
10 Environmental, sanitary
11 General, eng. sciences
12 Industrial
13 Mechanical
14 Metallurgical, materials
15 Mining, geological, petroleum
16 Nuclear
17 Operations research, systems
18 Engineering, other fields

PHYSICAL SCIENCES, MATHEMATICS
19 Astronomer
20 Atmospheric scientist (meteorologist)
21 Chemist
22 Computer programmer or analyst
23 Earth scientist (geologist, geophysicist)
24 Geographer
25 Mathematician, statistician
26 Oceanographer
27 Physicist
28 Physical scientist, other

SOCIAL SCIENCES
29 Economist
30 Linguist
31 Political scientist
32 Psychologist
33 Social, welfare, or rec'n worker
34 Sociologist or anthropologist
35 Social scientist, other

SERVICE
36 Law enforcement officer
37 Protective, other (fireman)
38 Military (career)
39 Other service occupation

SKILLED AND NONSKILLED WORK
40 Carpenter
41 Construction
42 Driver: truck, taxi or bus
43 Electrician
44 Factory worker, other
45 Farm or ranch laborer
46 Foreman
47 Mechanic, machinist or repairman
48 Plumber
49 Skilled tradesman, other
50 Other skilled worker
51 Other nonskilled worker

ARTS AND HUMANITIES
52 Artist (painter, sculptor)
53 Commercial artist (incl. designer, decorator)
54 Historian
55 Performing artist (incl. musician)
56 Photographer
57 Writer, journalist, interpreter

BUSINESS
58 Accountant or auditor
59 Banker or financier
60 Farm or ranch owner or manager
61 Government offical (incl. politician)
62 Manager or administrator other
63 Owner or proprietor
64 Public relations or advertising
65 Sales worker
66 Secretary, stenographer, typist or bookkeeper
67 Clerical worker, other
68 Business, other

PROFESSIONAL, TECHNICAL FIELDS
69 Architect, urban planner
70 Clergyman, minister, priest, rabbi
71 Counselor, guidance, family or school
72 Dentist (orthodontist)
73 Designer (industrial, etc.)
74 Draftsman
75 Home economist or dietician
76 Lawyer or judge
77 Librarian or archivist
78 Nurse
79 Optometrist
80 Pharmacist
81 Physician or surgeon
82 Teacher or administrator, college or university
83 Teacher or administrator, secondary school
84 Teacher or administrator, elementary school
85 Teacher or educational specialist, other
Technician
86 Biological and agricultural
87 Civil eng., construction, survey
88 Electrical, electronic eng.
89 Mech., automotive, manuf., eng.
90 Other engineering
91 Medical, dental
92 Physical sciences
93 Technician, other
94 Therapist (physical, occupational, speech)
95 Veterinarian
96 Other

OTHER
97 Homemaker (full-time)
98 Other, not elsewhere classified

MAJOR FIELDS

Use this list for Question 12. Find the number corresponding to the appropriate major fields (undergraduate and graduate) and mark it in the box and corresponding grid spaces provided on the questionnaire.

BIOLOGICAL SCIENCE
01 Agriculture, all fields
02 Anatomy and histology
03 Bacteriology
04 Biochemistry
05 Biology (general)
06 Biophysics
07 Botany, horticulture, plant pathology
08 Entomology
09 Forestry, all kinds
10 Genetics
11 Immunology
12 Marine/animal or life science
13 Microbiology
14 Physiology
15 Zoology
16 Other biological science

ENGINEERING
17 Astronautical, aerospace, astronautical
18 Agricultural
19 Architectural
20 Chemical
21 Civil
22 Electrical or electronic
23 Environmental, sanitary
24 General
25 Industrial
26 Mechanical
27 Metallurgical, material
28 Mining, geol., petro
29 Nuclear
30 Operations research, systems
31 Technology
32 Other engineering

PHYSICAL SCIENCE, MATHEMATICS
33 Astronomy
34 Atmospheric science (meteorology)
35 Chemistry
36 Computer science and data processing
37 Earth science (geology, geophysical)
38 Geography
39 Mathematics
40 Oceanography
41 Physics
42 Statistics
43 Other physical sciences

SOCIAL SCIENCE
44 Anthropology
45 Economics, all fields
46 Linguistics
47 Political science (incl. government, international relations)
48 Public administration
49 Psychology (all fields except clinical)
50 Social work, all fields
51 Sociology
52 Other social science

ARTS AND HUMANITIES
53 Art, fine and applied
54 English (language and literature)
55 Foreign language and literature
56 History
57 Journalism, all fields
58 Music, all fields
59 Philosophy, all fields

BUSINESS
60 Accounting
61 Business Administration (general)
62 Finance
63 Marketing and sales
64 Management, all fields
65 Secretarial studies
66 Other business

EDUCATION
67 Art or music
68 Biological sciences
69 Business
70 Elementary
71 Mathematics
72 Physical education or recreation
73 Physical sciences
74 Secondary
75 Science education, other
76 Special education
77 Other education

PROFESSIONS, TECHNICAL FIELDS
78 Architecture or urban planning
79 Clinical psychology
80 Dentistry
81 Drafting or design, all fields
82 Home economics
83 Health technology (med., dental or lab.)
84 Law or pre-law
85 Library or archival science
86 Medicine or pre-medicine
87 Nursing
88 Pharmacy
89 Religion
90 Other health professions
91 Other

OTHER
92 Building trades
93 Communications (radio, T.V.)
94 Crafts (skilled), all fields
95 Law enforcement
96 Machine operation
97 Military science
98 Other, not elsewhere classified
99 Undecided

IMPORTANT: PLEASE RETAIN THIS LIST FOR USE IN ANSWERING THE QUESTIONNAIRE

OMB No. 0309-0288

SAMPLE ADDRESS
110 ANY STREET
ANY CITY USA 55435

IF THERE ARE ANY ERRORS in your name and address as shown above, please enter any changes in the spaces provided.

Your Last Name | First Name | Init.
Street Address
City & State | Zip Code

SURVEY OF COLLEGE-EDUCATED MEN AND WOMEN

Conducted by the Laboratory for Research on Higher Education, UCLA, with the cooperation of the American Council on Education and the support of the National Science Foundation

DIRECTIONS: Your responses will be read by an optical mark reader. Your careful observance of these few simple rules will be most appreciated.
- Use only black lead pencil (No. 2½ or less).
- Make heavy black marks that fill the circle.
- Erase cleanly any answer you wish to change.
- Make no stray markings of any kind.

EXAMPLE: Are marks made in black pencil the only type the optical reader will recognize?
Yes ● No ○

1. Are you currently employed? (Mark one only)
- Yes — I have a full-time job ○
- Yes — I have a part-time job ○
- No — I have been seeking employment, but I have not received a satisfactory job offer ○
- No — I have not been seeking employment (I am a full-time student, homemaker, etc.) ○

IF 'NO' SKIP TO ITEM 8.

2. What is the location of your present job?
City
State

3. On the back of the letter enclosed with this questionnaire is a list of occupations. Use this list to locate the numerical code associated with each of the following:
(A) Your present occupation.
(B) Your probable career occupation or professional identification (based on your planned education, career interests, and job experience).

Write the numerical code in the appropriate box → Then, mark the matching circle below each box →

	A Your Present Occupation	B Your Planned Career
	○○	○○
	①①	①①
	②②	②②
	③③	③③
	④④	④④
	⑤⑤	⑤⑤
	⑥⑥	⑥⑥
	⑦⑦	⑦⑦
	⑧⑧	⑧⑧
	⑨⑨	⑨⑨

4. In which of the following work activities:
(A) Are you primarily engaged in your present job?
(B) Do you plan to concentrate in your long-range career occupation?
(Mark one in each column)

	A	B
Administration or management	Ⓐ	Ⓑ
Clerical	Ⓐ	Ⓑ
Computer or statistical applications	Ⓐ	Ⓑ
Consulting	Ⓐ	Ⓑ
Design	Ⓐ	Ⓑ
Development	Ⓐ	Ⓑ
Editing	Ⓐ	Ⓑ
Exploration	Ⓐ	Ⓑ
Farming	Ⓐ	Ⓑ
Operations and/or quality control	Ⓐ	Ⓑ
Performing arts	Ⓐ	Ⓑ
Production	Ⓐ	Ⓑ
Report and technical writing	Ⓐ	Ⓑ
Research	Ⓐ	Ⓑ
Retailing	Ⓐ	Ⓑ
Sales or distribution	Ⓐ	Ⓑ
Service to clients or patients	Ⓐ	Ⓑ
Service (other)	Ⓐ	Ⓑ
Skilled crafts (plumbing, carpentry, steamfitting, etc.)	Ⓐ	Ⓑ
Teaching or training	Ⓐ	Ⓑ
Technical services (Bio., Mech., Elec., etc.)	Ⓐ	Ⓑ
Testing	Ⓐ	Ⓑ
Other	Ⓐ	Ⓑ
Don't know yet		Ⓑ

5. In which area of the economy:
(A) Are you employed in your present job?
(B) Do you plan to be employed in your long-range career occupation?
(Mark one in each column)

	A	B
Agriculture (farming, forestry, fishing)	Ⓐ	Ⓑ
Business, Industry and Services		
Construction, mining, or manufacturing	Ⓐ	Ⓑ
Engineering or architecture	Ⓐ	Ⓑ
Finance, insurance, or real estate	Ⓐ	Ⓑ
Retail and wholesale trade	Ⓐ	Ⓑ
Services	Ⓐ	Ⓑ
Transportation, communications and other public utilities	Ⓐ	Ⓑ
Government:		
Federal	Ⓐ	Ⓑ
State	Ⓐ	Ⓑ
Local	Ⓐ	Ⓑ
Military	Ⓐ	Ⓑ
Education:		
Preschool or elementary school	Ⓐ	Ⓑ
Secondary school	Ⓐ	Ⓑ
College or university	Ⓐ	Ⓑ
Hospitals and Clinics	Ⓐ	Ⓑ
Other non-profit organizations	Ⓐ	Ⓑ
Self-employed	Ⓐ	Ⓑ
Other	Ⓐ	Ⓑ

(Note: Please check that your pencil markings are completely darkening the circles. Do not use pen or make ✓'s or X's. Thank You.)

6. Salary in present job: What is your basic annual (1974) salary or wage?
(Basic annual salary is earnings associated with principal employment before deductions for income tax, social security, retirement, etc. It does not include bonuses, overtime, summer teaching, or other extra payments, rental or subsistence allowances.)
(Mark one only)
- None ○
- Less than $2,500 ○
- $2,500 – $4,999 ○
- $5,000 – $7,499 ○
- $7,500 – $9,999 ○
- $10,000 – $12,499 ○
- $12,500 – $14,999 ○
- $15,000 – $17,499 ○
- $17,500 – $19,999 ○
- $20,000 – $22,499 ○
- $22,500 – $24,999 ○
- $25,000 or more ○

If academically employed, mark whether salary is for
- 9 – 10 months ○
- 11 – 12 months ○

7. Listed below are selected topics of critical national interest. If you devote a significant proportion of your professional time to any of these problem areas, please mark the circle for the one on which you spend MOST time.
(Mark one only)
- Health ○
- Education: Teaching ○
- Other ○
- Space ○
- Environmental protection (e.g., pollution control) ○
- Crime prevention and control ○
- Food production and technology ○
- Energy and fuel ○
- Other mineral resources ○
- Community development and services ○
- Housing (planning, design, construction) ○
- Does not apply ○

8. Which of the following best describes your current enrollment status?
(Mark one only)
- Not a student ○
- Undergraduate student: Full-time ○
- Part-time ○
- Graduate student (post-baccalaureate):
- Full-time ○
- Part-time ○

9. Which of the following have you done? (Mark all that apply)
- Served in the military ○
- Participated as a high school student in the NSF-sponsored Student Science Training Program during a summer or a school year ○
- Participated as a college undergraduate in the NSF-sponsored Undergraduate Research Participation Program (URP) ○
- Attended more than one undergraduate college ○
- Attended a junior or community college ○
- Graduated from college with honors ○
- Finished undergraduate work in 3½ years or less ○
- Received credit for a college course by examination in lieu of taking the course ○
- Held a full-time job for a semester or longer while enrolled in college ○
- Held a part-time job for a semester or longer while enrolled in college ○
- Served as a member of a student-faculty committee in college ○
- Was elected to a student office in college ○
- Changed undergraduate major ○
- Attended summer school to speed up degree completion ○
- Attended summer school to make up an academic deficiency ○
- As an undergraduate, assisted a professor on a research project ○
- Served as a laboratory assistant while an undergraduate ○
- Frequently read books or articles in major field beyond those required for course assignments ○

10. What is the highest degree:
(A) You now (1974) hold?
(B) You expect to obtain eventually?
(Mark one in each column)

	You Now Hold	You Expect To Hold
None	Ⓐ	Ⓑ
Associate (A.A.)	Ⓐ	Ⓑ
Bachelor's (B.A., B.S.)	Ⓐ	Ⓑ
Master's (M.A., M.S., M.Ed.)	Ⓐ	Ⓑ
Ph.D., Ed.D., Sc.D., Eng.D.	Ⓐ	Ⓑ
M.D., D.D.S., or D.V.M.	Ⓐ	Ⓑ
L.L.B. or J.D. (Law)	Ⓐ	Ⓑ
Other professional degree	Ⓐ	Ⓑ

In what year did you receive the highest degree you now hold? (Mark one only)

69	70	71	72	73	74
○	○	○	○	○	○

11. What is the name of your current (or most recently attended) undergraduate college? →
Name
City and State

If you are now attending, have attended or will attend graduate or professional school, what is the name of the institution? →
Name
City and State

12. On the back of the letter enclosed with this questionnaire is a list of academic fields grouped into areas. Use this list to locate the numerical code associated with each of the following:
(A) Your current or last undergraduate major field.
(B) Your current or last graduate major field (or your intended field if you plan to enroll in 1974–1975).

Write the numerical code in the appropriate box → Then, mark the matching circle below each box →

	(A) Undergraduate	(B) Graduate
	○○	○○
	①①	①①
	②②	②②
	③③	③③
	④④	④④
	⑤⑤	⑤⑤
	⑥⑥	⑥⑥
	⑦⑦	⑦⑦
	⑧⑧	⑧⑧
	⑨⑨	⑨⑨

13. What is your cumulative undergraduate grade-point average for:
(A) all courses for the entire time you have attended college; and
(B) all courses in your major for the entire time you attended college (computed on a four-point scale)?

(Mark one in each column) →	All Courses	Major
3.75 – 4.00 (A or A+)	○	○
3.25 – 3.74 (A- or B+)	○	○
2.75 – 3.24 (B)	○	○
2.25 – 2.74 (B- or C+)	○	○
1.75 – 2.24 (C)	○	○
1.25 – 1.74 (C- or D+)	○	○
Less than 1.25 (D or less)	○	○

14. Rate each of the following as it applies to your most recently attended undergraduate college.

(Mark one for each line)	Excellent	Good	Satisfactory	Unsatisfactory	No Opinion
The quality of your undergraduate education	○	○	○	○	○
The opportunities to discuss your work outside the classroom with professors in your major field of study	○	○	○	○	○
The facilities for library research	○	○	○	○	○
The variety of science courses	○	○	○	○	○
The quality of science instruction	○	○	○	○	○
The opportunities you had to do scientific research as an undergraduate	○	○	○	○	○
The science equipment and facilities at your school	○	○	○	○	○
The opportunities for extracurricular science activities and projects at your school	○	○	○	○	○
The variety of courses in arts and humanities	○	○	○	○	○
The quality of instruction in the arts and humanities	○	○	○	○	○
How well your undergraduate training has prepared you for your future career	○	○	○	○	○
How well your undergraduate education gave you a general understanding of scientific methods and the role of science and technology in modern society	○	○	○	○	○

15. Please give your best estimate of the dollar amount of the total funds you received from each of the following sources for financing your entire undergraduate education.

(Include academic and living expenses, i.e., tuition and fees, room and board. Exclude the value of room and board provided by your parents if you lived at home.)

Support from spouse	$_____
Support from parents or other family	$_____
Fellowships, scholarships or grants	$_____
Loans	$_____
GI or Social Security dependents' benefits	$_____
Your own employment	$_____
Your own personal funds	$_____
Other sources	$_____
TOTAL	$_____

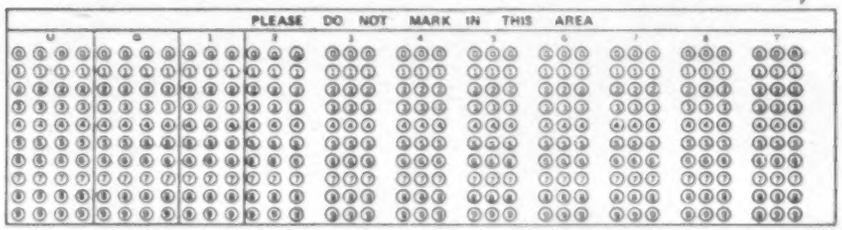
16. During your undergraduate years, what proportion of your courses were graded on a "pass-fail" or similar non-graded basis?

(Mark one only)

- None ○
- Less than 10% ○
- 10% – 25% ○
- 26% – 50% ○
- More than 50% ○

Please continue ⇨

PLEASE DO NOT MARK IN THIS AREA



17. Please indicate which of the following applied to you at any time during each of the academic years (September – June) listed below:

(Mark all that apply in each column)	ACADEMIC YEARS 19 70	70 71	71 72	72 73	73 74
Education					
Undergraduate college, full-time	○	○	○	○	○
Undergraduate college, part-time	○	○	○	○	○
Graduate or professional school	○	○	○	○	○
Employment Status					
Working full-time	○	○	○	○	○
Working part-time					
Federally sponsored work-study program	○	○	○	○	○
Other on-campus work	○	○	○	○	○
Off-campus work	○	○	○	○	○
Not employed, looking for a job	○	○	○	○	○
Not employed, not looking for a job	○	○	○	○	○
Housing					
With parents	○	○	○	○	○
College dormitory (coed)	○	○	○	○	○
College dormitory (not coed)	○	○	○	○	○
Fraternity or sorority house	○	○	○	○	○
Apartment or room	○	○	○	○	○
Other	○	○	○	○	○

18. (A) Did you ever drop out of undergraduate college, either temporarily or permanently?

Yes ○ No ○

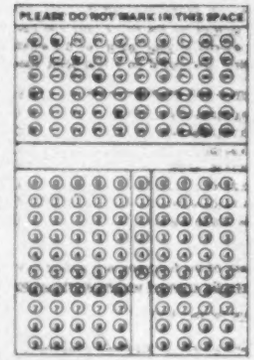
(B) Did you delay entrance to graduate or professional school after receiving your baccalaureate degree?

Yes ○ No ○

If you answered "Yes" to either (A) or (B) (or both) of the above questions, what were the major reasons for this decision?

(Mark all that apply in each column)	(A) Dropping Out	(B) Delaying Advanced Study
Good job offer	○	○
Change in career goals	○	○
Community or political activities	○	○
Peace Corps or VISTA	○	○
Military or C.O. duty	○	○
Travel	○	○
Desire for work experience	○	○
Lack of vacancy in the department	○	○
Disciplinary troubles	○	○
Poor grades	○	○
Dissatisfaction with requirements, rules	○	○
Desired courses or program not available	○	○
Boredom with courses	○	○
Difficulty in commuting to college	○	○
Illness or accident	○	○
Marriage, children or other family responsibilities	○	○
Financial difficulties	○	○

PLEASE DO NOT MARK IN THIS SPACE



19. Have you ever been married?
(Mark one only)

- No ○
- Yes, I was married:
  - Before entering college ○
  - While in college ○
  - After college ○

Are you married now?

Yes ○ No ○

20. How many children do you have?
(Mark one only)

- None ○
- One ○
- Two or more ○

THANK YOU
FOR YOUR COOPERATION

Please return the questionnaire in the postage paid, self addressed envelope to:

SURVEY OF COLLEGE EDUCATED
MEN AND WOMEN
Intran Processing Center
4555 West 77th Street
Minneapolis, Minnesota 55435

55404

NATIONAL RESEARCH COUNCIL

NATIONAL ACADEMY OF SCIENCES · NATIONAL ACADEMY OF ENGINEERING

2101 CONSTITUTION AVENUE · WASHINGTON, D.C. 20418

OFFICE OF SCIENTIFIC PERSONNEL

March 1973

Dear Colleague

The National Science Foundation has asked the National Academy of Sciences-National Academy of Engineering-National Research Council to assist it in operating the Manpower Characteristics System. The Foundation has established the System to provide data needed to assay this Nation's human resources in the sciences and engineering and guide in the development of national policies and programs.

As our part of the task, we shall maintain information about recipients of the earned doctorate in the natural and social sciences, mathematics, and engineering. Already available data will be utilized to the greatest extent possible. We believe the Survey of Doctoral Scientists and Engineers will provide critically needed data bearing on the problem of utilization and supply of doctoral scientists and engineers, the support of graduate education, and the support of research and development and postdoctoral activities.

We seek your help. You are one of a carefully drawn sample of doctoral scientists and engineers who are being asked to provide current data. The questionnaire on the following pages has been designed to make minimum demands upon your time and yet to provide data that in the aggregate will be statistically significant and useful. Some data already available to us have been preprinted on the form to conserve your time.

Information provided will be treated as privileged and used only for purposes of statistical description. Summaries will be published after analysis of the results.

Please complete and return the questionnaire promptly. A self-addressed envelope is enclosed for your convenience. Your assistance will be greatly appreciated and, indeed, is essential to the success of this project.

Sincerely yours,

Robert A. Alberty

Robert A. Alberty
Chairman, Advisory Committee

PLEASE DO NOT WRITE ON THIS PAGE

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SURVEY OF DOCTORAL SCIENTISTS AND ENGINEERS

CONDUCTED BY THE NATIONAL RESEARCH COUNCIL WITH THE SUPPORT OF THE NATIONAL SCIENCE FOUNDATION

The letter on the adjacent page requests that you assist in this survey of doctoral scientists and engineers — including the fields of the natural and social sciences, mathematics, and engineering.

Please print or type your answers on this first page. If selected information has been printed by computer, check to be certain the entries are CORRECT and COMPLETE. The second page has special instructions. After the form has been completed, please return it in the enclosed envelope to: Manpower Studies Branch, Office of Scientific Personnel, National Research Council, 2101 Constitution Avenue, Washington, D.C. 20418.

NOTE: ALL INFORMATION IS REGARDED AS CONFIDENTIAL AND WILL BE USED FOR STATISTICAL PURPOSES ONLY. IT WILL NOT BE RELEASED IN ANY WAY THAT WILL ALLOW IT TO BE IDENTIFIED WITH YOU.

If your name and address are incorrect, please enter correct information to the right. Include zip code.

Please Do Not Write In This Space

If there is an alternate address through which you could be reached, please provide it in the space below.

Number · Street · City · State · Zip Code

VITA

1. Date of Birth (Mo., Day, Yr.)
2. State or Foreign Country of Birth
3. State or Foreign Country of Secondary School Graduation
4. Sex: ☐ 1 Male ☐ 2 Female
5. Citizenship: ☐ 0 USA ☐ 1 Non-USA (specify country)
6. Social Security No.
7. Race (Please check one): ☐ 0 White, Caucasian ☐ 1 Black, Negro ☐ 2 American Indian ☐ 3 Asian, specify ☐ 4 Other, specify
8. Ethnic Group (Please check one): ☐ 0 Puerto Rican American ☐ 1 Mexican American (Chicano) ☐ 2 Spanish American ☐ 3 Afro-American ☐ 4 None of these (Please specify any other)
9. List in the table below all collegiate and graduate degrees that have been awarded to you, e.g. BA/BS, MA/MS, PhD. If some information has been entered by computer, please be sure it is CORRECT and COMPLETE (including the number and name of the specialty field from the list on the reverse side).

Type of Degree	Granted Mo.	Granted Yr.	Major Field (See Specialties List) Name	Major Field (See Specialties List) Number	Institution Name	City (or campus) and State
BS						
MS						
PhD						

10. Name of your doctoral thesis advisor (please print FULL name): (First Name) (Middle Initial) (Last Name)

PROFESSIONAL EMPLOYMENT

11. Please give the name of your present principal employer (organization, company, etc., or, if self-employed, "self"), and actual place of employment.

Name of present principal employer · Actual place of employment (city, state and zip code)

If employed by a university, college, or junior college, please check the rank of your present position.

☐ 0 Professor ☐ 1 Associate Professor ☐ 2 Assistant Professor ☐ 3 Instructor ☐ 4 Lecturer ☐ 5 Other, specify

12. Please give the basic annual salary associated with your principal professional employment in 1972 and 1973. If you were on a postdoctoral appointment (e.g., fellowship, traineeship, research associateship) give your annual stipend plus allowances below.

1972 $ 1973 $

(Basic Annual Salary is your annual salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for professional work.)

If academically employed, check whether salary is for:

	1972	1973
9-10 mos.	☐	☐
11-12 mos.	☐	☐

PLEASE CONTINUE

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PLEASE READ DIRECTIONS ON ADJACENT PAGE

13. What is your employment status? (Mark all that apply)

	1972	1973
Employed full-time, science or engineering related position	○	○
Employed full-time, nonscience or nonengineering related position. (Complete 13a below)	○	○
Employed part-time, science or engineering related position (Complete 13b below)	○	○
Employed part-time, nonscience or nonengineering related position (Complete 13b below)	○	○
Postdoctoral appointment (fellowship, traineeship, research associateship, etc.) (Complete 13c below)	○	○
Unemployed and seeking employment	○	○
Specify number of months unemployed: ____		
Unemployed and not seeking employment	○	○
Retired and not seeking employment	○	○
Specify year of retirement: ____		
Other, specify: ____	○	○

13a. If you are employed full-time in 1973 in a position unrelated to science or engineering, what was the MOST important reason for taking the position?

	1973
Prefer nonscience or nonengineering position	○
Promoted out of science or engineering position	○
Pay is better	○
Locational preference	○
Science or engineering position not available	○
Other, specify: ____	○

13b. If employed part-time in 1973, are you seeking full-time employment?

	1973
Yes	○
No	○

13c. If on postdoctoral appointment in 1973, what was the MOST important reason for taking the appointment?

	1973
Sought additional research experience in field	○
Opportunity to change to another field	○
Employment position not available	○
Other, specify: ____	○

14. If employed or on a postdoctoral appointment in 1973, please indicate the term of employment or appointment.

	1973
Three months or less	○
More than 3 months, not more than one year	○
More than one year, not more than 3 years	○
More than 3 years, not more than 5 years	○
Permanent or tenured position	○

15. Which categories best describe the sector of the economy and type of organization of your principal employer or postdoctoral affiliation?

	1972	1973
A. Sector: Public	○	○
Private	○	○
B. Type of organization:		
Business or industry	○	○
Junior college, 2-year college, technical institute	○	○
Medical school	○	○
4-year college or university, (other than medical school)	○	○
Elementary or secondary school system	○	○
Hospital or clinic	○	○
U.S. military service, active duty, or Commission Corps (e.g., USPHS, NOAA)	○	○
U.S. government, civilian employer	○	○
State government	○	○
Local or other government, specify: ____	○	○
International agency	○	○
Non-profit organization, other than hospital, clinic, or educational institution	○	○
Other, specify: ____	○	○

16. What are the primary (A) and secondary (B) work activities related to your position?

	1972 A	1972 B	1973 A	1973 B
Management or administration of:				
Research and development	○	○	○	○
Other than research and development	○	○	○	○
Both	○	○	○	○
Basic research	○	○	○	○
Applied research	○	○	○	○
Development of equipment, products, systems, data	○	○	○	○
Design	○	○	○	○
Teaching	○	○	○	○
Report or other technical writing, editing	○	○	○	○
Production	○	○	○	○
Consulting, specify: ____	○	○	○	○
Professional services to individuals	○	○	○	○
Quality control, inspection, testing	○	○	○	○
Sales, marketing, purchasing, estimating	○	○	○	○
Other, specify: ____	○	○	○	○

17. From the specialties list on the adjacent page, select and enter both the number and title of the scientific specialty most closely related to your principal employment or postdoctoral appointment. Write in your specialty if it is not on the list.

1972 Number ____

1973 Number ____

18. Is ANY of your work being supported or sponsored by U.S. government funds?

	Yes	No	Don't Know
1972	○	○	○
1973	○	○	○

If yes, which of the following federal agencies or departments are supporting the work? (Mark all that apply.)

	1972	1973		1972	1973
NASA	○	○	Dept. of Defense	○	○
NSF	○	○	Dept. of Commerce	○	○
EPA	○	○	Dept. of Agriculture	○	○
AEC	○	○	Dept. of Transportation	○	○
AID	○	○	Dept. of Interior	○	○
Dept. of Health, Educ., & Welfare			Dept. of Housing and Urban Development	○	○
NIH	○	○	Dept. of Justice	○	○
Health Services & Mental Health Admin.	○	○	Other agency or dept. specify: ____	○	○
Office of Educ.	○	○			
Other HEW, specify: ____	○	○	Don't know source	○	○

This is the end of the questionnaire. Thank you.

Please Do Not Write in This Space

DIRECTIONS. Your responses to this portion of the questionnaire will be read by an optical mark reader. Your careful observance of these few simple rules will be most appreciated.

- Use only black lead pencil (No. 2½ or less).
- Make heavy black marks that fill the circle.
- Erase cleanly any answer you wish to change.
- Make no stray markings of any kind.

EXAMPLE

Will marks made with ball-point, felt-tip, or fountain pen be properly read?

Yes	No
○	●

PLEASE NOTE that we are requesting that you furnish the following information for both the current year, as of the time you receive this form, and last year, as of March 31, 1972. Fill in the category of each item which most appropriately describes your status in 1972 and 1973. Unless otherwise specified, mark only one category in each year.

SPECIALTIES LIST

MATHEMATICAL SCIENCES

300 Algebra
310 Analysis & Functional Analysis
320 Geometry
330 Logic
340 Number Theory
350 Probability
355 Math. Statistics (see also 544, 670, 725, 729)
360 Topology
380 Computing Theory & Practice
385 Operations Research (see also 477)
390 Applied Mathematics
395 Combinatorics & Finite Mathematics
397 Physical Mathematics
398 Mathematics, General
399 Mathematics, Other*

ASTRONOMY

Astronomy
Astrophysics

PHYSICS

Atomic & Molecular Physics
Electromagnetism
Mechanics
Acoustics
Fluids
Plasma Physics
Optics
Thermal Physics
Elementary Particles
Nuclear Structure
Nuclear Reactions
Physics, General
Physics, Other*

CHEMISTRY

List A

Analytical Chemistry
Organic Chemistry
Inorganic Chemistry
Physical Chemistry
Polymers
Chemistry, General
Chemistry, Other*

List B

Enter here to classify persons professionally engaged (for the most part) in the specialties listed in List A. Also use this box for the items in Item 9.

200 Agricultural Chemistry
215 Synthetic Organic & Organometallic Chemistry
225 Synthetic Inorganic & Natural Products
230 Nuclear Chemistry
240 Quantum Chemistry
255 Structure of Chemicals
265 Thermodynamics & Chemical Equilibrium
270 Polymers
280 Chemical Dynamics

NOTE: Please enter List B fields to identify your doctoral degree of more than one specialization which is important in addition to the field shown here in List A. Print the List B field inside the decimal point. Items 1 & 2.

EARTH, ENVIRONMENTAL & MARINE SCIENCES

Mineralogy, Petrology
Sedimentation
Stratigraphy, Paleontology
Economic Geology
Geochemistry
Geophysics, Solid Earth & Atmospheric
Geomorphology, Glaciology
Hydrology
Oceanography
Meteorology
Environmental Sciences, General
Environmental Sciences, Other*
Geology, Mineralogy, Geog., Engr., Earth Sciences, General
Earth Sciences, Other*

ENGINEERING

400 Aeronautical & Astronautical
410 Agricultural
415 Biomedical
420 Civil
430 Chemical
435 Ceramic
440 Electrical
445 Electronics
450 Industrial, Manufacturing
455 Nuclear
460 Engineering Mechanics
465 Engineering Physics
470 Mechanical
475 Metallurgy & Phys. Met. Engr.
477 Operations Research, Systems (see also 385)
479 Fuel Technology, Petrol. Engr.
480 Sanitary, Environmental
486 Mining
487 Materials Science Engr.
488 Engineering, General
489 Engineering, Other*

AGRICULTURAL SCIENCES

500 Agronomy
501 Agricultural Economics
502 Animal Husbandry
504 Fish & Wildlife
505 Forestry
506 Horticulture
507 Soils & Soil Science
510 Animal Sciences
511 Phytopathology
513 Food Science & Technology (see also 518)
518 Agriculture, General
519 Agriculture, Other*

MEDICAL SCIENCES

520 Medicine & Surgery
522 Public Health
523 Veterinary Medicine
524 Medical Administration
526 Pathology
528 Pharmacology
530 Pharmacy
538 Medical Sciences, General
539 Medical Sciences, Other*

BIOLOGICAL SCIENCES

540 Biochemistry
542 Biophysics
543 Biomathematics
544 Biometrics, Biostatistics (see also 355, 670, 725, 729)
545 Anatomy
546 Cytology
547 Embryology
548 Histochemistry
550 Botany
560 Ecology
564 Ethology
565 Microbiology & Bacteriology
566 Physiology, Animal
567 Physiology, Plant
569 Zoology
570 Genetics
571 Cytogenetics
572 Molecular Biology
573 Food Science & Technology (see also 513)
574 Biological Ethology
578 Biological Sciences, General
579 Biological Sciences, Other*

PSYCHOLOGY

600 Clinical
610 Counseling & Guidance
625 Developmental & Gerontological
630 Educational
635 School Psychology
641 Experimental
642 Comparative
643 Physiological
650 Industrial & Personnel
660 Personality
670 Psychometrics (see also 355, 544, 725, 729)
680 Social
688 Psychology, General
689 Psychology, Other*

SOCIAL SCIENCES

700 Anthropology
703 Archeology
708 Communications*
709 Linguistics
710 Sociology
720 Economics (see also 501)
725 Econometrics (see also 355, 544, 670, 729)
729 Social Statistics (see also 355, 544, 670, 725)
740 Geography
745 Area Studies*
750 Political Science, Public Admin.
755 International Relations
770 Urban & Reg. Planning
775 History & Phil. of Science
788 Social Sciences, General
789 Social Sciences, Other*

ARTS & HUMANITIES

841 Fine & Applied Arts (including Music, Speech, Drama, etc.)
842 History
843 Philosophy, Religion, Theology
845 Languages & Literature
846 Other Arts and Humanities*

EDUCATION & OTHER PROFESSIONAL FIELDS

Education

Business Administration
Home Economics
Journalism
Speech and Hearing Sciences
Law, Jurisprudence
Social Work
Library & Archival Science
Professional Field, Other*

999 OTHER FIELDS*

*Specify the specialty field in the space provided on the questionnaire.

☆U.S. GOVERNMENT PRINTING OFFICE: 1977— 241 314 3

Other Science Resources Publications

REPORTS	NSF No.	Price
Detailed Statistical Tables. Graduate Science Education: Student Support and Postdoctorals, Fall 1975	76-318	——
Detailed Statistical Tables. Expenditures for Scientific Activities at Universities and Colleges, Fiscal Year 1975	76-316	——
Detailed Statistical Tables. Federal Funds for Research, Development, and Other Scientific Activities, Fiscal Years 1975, 1976, and 1977, Volume XXV	76-315	——
1985 R&D Funding Projections	76-314	$0.75
Manpower Resources for Scientific Activities at Universities and Colleges, January 1975	76-311	$1.45
Detailed Statistical Tables. Manpower Resources for Scientific Activities at Universities and Colleges, January 1975	75-329	——
National Patterns of R&D Resources. Funds & Manpower in the United States, 1953-1976	76-310	$0.95
Reviews of Data on Science Resources, No. 27, "Education and Work Activities of Federal Scientific and Technical Personnel, January 1974"	76-308	$0.40
Federal Support to Universities, Colleges, and Selected Nonprofit Institutions, Fiscal Year 1974	76-305	$1.80
Detailed Statistical Tables. Federal Support to Universities, Colleges, and Selected Nonprofit Institutions, Fiscal Year 1974	75-325	——
Reviews of Data on Science Resources, No. 26, "Energy and Energy-Related R&D Activities of Federal Installations and Federally Funded Research and Development Centers: Funds, FY 1973-75 (est.) and Manpower, Jan. 1973-75 (est.)	76-304	$0.35

REPORTS	NSF No.	Price
Projections of Degrees and Enrollment in Science and Engineering Fields to 1985	76-301	$1.15
Reviews of Data on Science Resources, No. 23, "R&D Expenditures of State Public Institutions, Fiscal Year 1973"	75-311	$0.35
R&D Activities of Independent Nonprofit Institutions, 1973	75-308	$1.90
Research and Development in State Government Agencies, Fiscal Years 1972 and 1973	75-303	$1.80
Young and Senior Science and Engineering Faculty, 1974: Support, Research Participation, and Tenure	75-302	$1.70
Projections of Science and Engineering Doctorate Supply and Utilization, 1980 and 1985	75-301	$1.30

HIGHLIGHTS		
"Self-Supported Graduate Science Students Increased by 22 Percent in 1975"	76-320	——
"Real Increases Seen for Federal R&D Funding for Energy, Education, Science, and Defense in FY 1977"	76-319	——
"Federal R&D Funding Shows Moderate Increase for FY 1977"	76-317	——
"Academic R&D Spending Up 12 Percent in FY 1975"	76-307	——
"Industrial R&D Expenditures Rise to $22 Billion in 1974"	76-300	——